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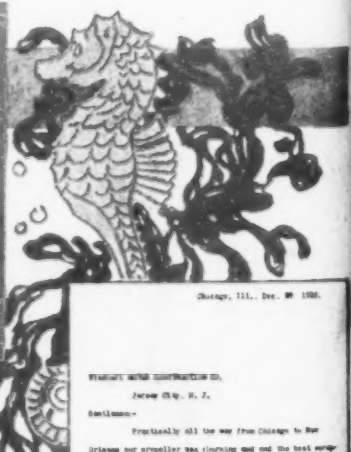
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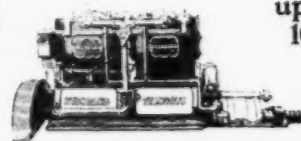
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The photograph on this page shows a beach patrol of the Life Saving Service on the lookout for disabled vessels.

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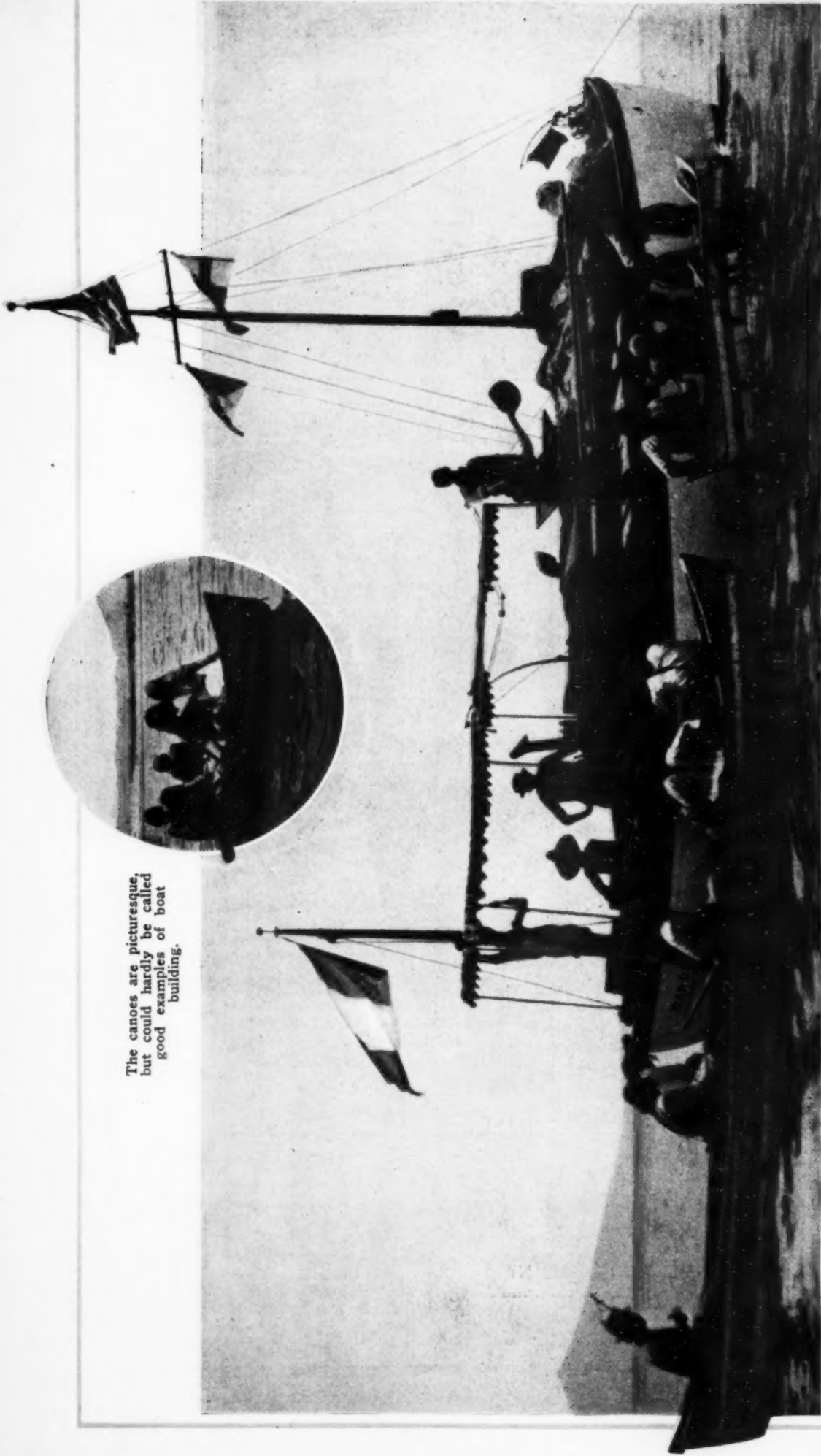
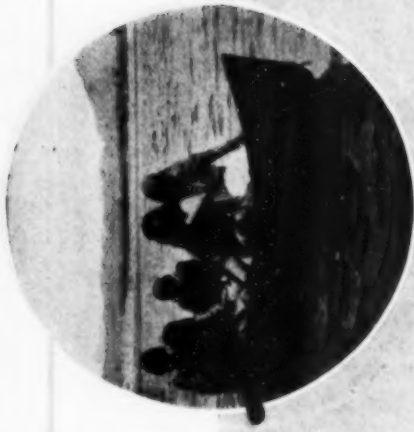
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The canoes are picturesque, but could hardly be called good examples of boat building.



Seri Indians Visiting the Wanderer at Tiburon

Wanderer is a 47-footer built in Maine in 1907. She has cruised in Atlantic waters, through the Great Lakes and along the Pacific Coast from Alaska to Central America. She is driven by a 25-H.P. Standard and for emergency use is provided with a substantial yawl rig.





The Cruise of the Wanderer.

Adventures and Explorations of Three Gringos While Opening New Regions for Motor Boating In the Unknown Waters of the Gulf of California.

By Michael Williams.

Author of "Real Men Stories of Arizona," "A Fight in One Round," etc., etc.
Photographs by E. A. Salisbury and the Author.

PART I.

We Run the Blockade of a Revolution—We Land the First White Woman Ever to Touch at Mysterious Tiburon—and Then Take Chances With the "Cannibal" Seris.

Most of us, at some time or other, have planned elaborate cruises to far-away places. It's merely the working of that spirit called by some the "wanderlust," by others the "call of the wild," and by the few who don't know it, just plain foolishness. Where many of us fall down is in the materialization; but Mr. Williams hasn't, and here is the story of an actual motor boat cruise to the legendary Island of Tiburon, in the Gulf of California, the home of the notorious Seris.—EDITOR.

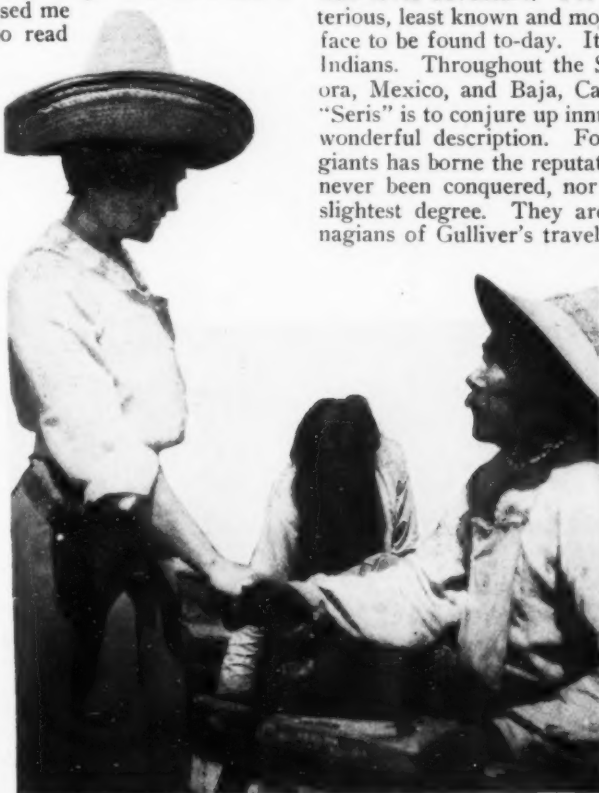
SOMEONE dropped a copy of the Los Angeles Examiner one day in the hallway of a lodging-house in Tucson, Arizona. I chanced to pick it up. I was about to throw it away when I noticed it was several days old, but I saw a word—a magic word! And it caused me to keep the paper, and eagerly to read what went with the word in question, and then and there led me to get busy with a project that resulted—in what I'm going to tell you about—a motor boat cruise of more than five hundred miles on board of one of the most celebrated gasoline consumers afloat, in company with one of the greatest of the motor boatmen, big game hunters and all-around sportsmen in America, through one of the least-known but most romantic and beautiful water regions in the world, including an incidental armed expedition to a cannibal island, a search for buried treasure and another for a prehistoric city of the Aztecs, with hunting and fishing galore thrown in—to say nothing about landing the first white woman ever to visit the mysterious island of Tiburon, and running the gauntlet of Madero's revolution!

Some motor boat trip, believe me!

"Tiburon" was the word I glimpsed in the newspaper, which proved of such magical potency. During several years

of a wandering life in various parts of the great Southwest I had frequently heard that word, "Tiburon," and ever and always it connoted things that are the real things to the man who loves adventure. For Tiburon is one of the most mysterious, least known and most legendary bits of the earth's surface to be found to-day. It is the home and haunt of the Seri Indians. Throughout the Southwest, more especially in Sonora, Mexico, and Baja, California, to say "Tiburon," or the "Seris" is to conjure up innumerable tales of the most wild and wonderful description. For hundreds of years this tribe of giants has borne the reputation of being cannibals. They have never been conquered, nor christianized, nor civilized in the slightest degree. They are the prototypes of the Brobdingnagians of Gulliver's travels and of the Amazons of Spanish-

American legends who guarded on their shark-surrounded island—"Tiburon" is Spanish for shark)—the richest of gold and silver placers and of pearl oyster beds. Time after time they have killed explorers or prospectors who ventured to land. The weirdest tales imaginable have been told—even in the gravest of print, supported by affidavits, at that!—of the existence of gigantic idols and huge altars stained with the blood of human sacrifices in the dim valleys of interior Tiburon. The terror of their poisoned arrows, of their outrageous personal strength and of their mode of fighting with teeth and sharp-nailed hands and feet, as the wild beasts fight, has behind it the traditions of centuries, and is still most active in Sonora.



The first white woman to land at Tiburon, greeted by Juan Tomas, chief of the Seris.

According to J. W. Powell, director of the Smithsonian Institution's Ethnology Bureau, "among the aborigines known to Caucasians, the Seri Indians appear to stand nearly or quite at the foot of the scale." Only a little while before I had seen this definition of the Seris of Tiburon, I had read in Arthur W. North's book of travels in Lower California that "from the summer of 1540, when Hernando de Alarcon, one of Cortez's admirals, finding the sea surrounding the island swarming with voracious sharks, gave the land its name, Tiburon Island has been a place of ill repute amongst men. By the middle of the eighteenth century the hostility of the Seris toward strangers had become proverbial. Neighboring Indian tribes, Spaniards, Mexicans, Americans, indeed, all visiting aliens have found the Seris inexplicably treacherous and hostile. Non-agricultural barbarians, scantily attired in pelican skins, partial to meat uncooked, these isolated aborigines are possessed of a pride of race so fierce and intense that to mingle their blood with alien blood is an indefensible crime.

"They are essentially warriors. Over fifty recorded attempts have failed to subjugate them. Most cunning of nature, and of unequalled endurance, together with a demoniac thirst for blood, they have repulsed or eluded all comers. It is said that they obtain the poison for their arrows by pressing the weapons into partially putrified deer or beef livers within which a repulsive mass of centipedes, tarantulas and rattlesnakes have been placed to war to the bitter death. . . . So many of the visitors to Tiburon Island, however, have disappeared, leaving no sign, that most knowledge of the people and their customs is veiled in uncertainty. Of recent travelers who have never returned from the Seris I will mention two San Francisco newspaper correspondents, murdered in 1894, a party of prospectors who effected a landing in 1896, two traders who were made away with in 1898, and the Grindell party a few years later." (Mr. North, however, I will here interpolate, is in error concerning the Grindell party. Led by Grindell, a young Arizonian, this party of prospectors died in the horrible deserts of the Gulf region, of thirst—but from careful inquiries made in Sonora, I am sure that they never reached Tiburon, and that the Seris are innocent of the crimes of murder and cannibalism in this case.)

Well, this was the Tiburon named in the chance-found paper, in a column interview with one E. A. Salisbury, a wealthy rancher of Guaymas, Mexico, who, it seems, had made the exploring of and the hunting on Tiburon Island his pet and

particular hobby! For more than four years past, said the interview, in his motor boat, the Wanderer, Salisbury had been cruising and exploring and hunting and fishing in the waters of the Gulf of California, and had been admitted to the friendship of Juan Tomas, the present chief of the Seris, and had been permitted to see Tiburon Island as no other white man ever had.

I got busy at once. I wrote to Mr. Salisbury, saying, in effect, "Please, won't you please take me to Tiburon in your motor boat?" It was a "nervy proposition," as a drummer might say; but, like many such propositions, it made good. Salisbury wrote from Guaymas: "Sure. Come on along! The water's fine!" I said to Mrs. Williams—companion of my wanderings in Arizona, where at that time I was collecting material on the border for a book of Real Men Stories—"What do you say?" She said, "Why, of course! Wouldn't miss the chance for anything!" So we packed up and before night we were on our way via the West Coast railroad to Guaymas.

There was, by the bye, a revolution going on in Mexico, a real, sure-enough revolution, not one of the comic opera kind that ordinarily holds the stage. But what did we care? Really, we didn't care a jot, tittle, or any other fraction or portion of anything whatsoever. This despite our friends in Tucson, who said:

"If nothing worse happens, such as being shot, or held for ransom by some guerrilla band, or out-and-out bandits, you're more than likely to be cut off in Mexico." For we would be obliged to travel several hundred miles through the war zone on a railroad along the line of which bridges were being dynamited and towns captured and re-captured daily, and where many fierce little battles were being waged. To go to Seriland at any time, said our kind friends (not all of them to be sure, for many were aching to go themselves!), was a risky business at best, but to go during a sure-enough revolution, when the country was seething and boiling over with discontent and hostility toward Americanos, was—Oh, well, you can imagine the kind of wisecrack talk they indulged in! And it all went in one ear and blew out through the other ear without even jolting our minds to attention in its passage.

And next morning we were safely in Guaymas. And nothing had happened! Not a thing! There were lots of swarthy little men going to and fro on the train, and marching in the brush, and lounging in the streets of the towns we passed through, armed to the teeth, and looking as if the fighting business was prospering; but there were no thrills; there was noth-



Salisbury was already "in right" with the Seris, who gallantly suppressed their cannibalistic tendencies.

ing doing. So we gave the revolution the mild, satiric "ha! ha!" and let it go at that—not knowing that it would put one over on us before very long.

Salisbury was waiting for us at the hotel upon the waterfront of Guaymas harbor, where the trim Wanderer was tied up to the wharf taking on the gasoline and supplies. For no time was to be wasted. Salisbury already had secured the requisite permits from the governmental authorities, and as soon as we should visit the market and do some more shopping, we would start. It didn't take us long to get acquainted. Salisbury—take my word for it—is the kind of man who makes getting acquainted easy and pleasant. I had already

Salisbury takes a shot at a shark.
There are all sorts of things to shoot,
for those who like it.



heard of his adventurous disposition, and he looked the part of the modern Nimrod—a big, hearty American businessman-sportsman, who has hunted everywhere in the two Americas, and has a reputation as a motor-boatman that is A No. 1, and then some!

He's a Californian, but for some years has made Guaymas his home. The opening up of the wonderful Gulf of California to American yachtsmen and hunters and pleasure-seekers is his particular hobby. He is known to and by everybody in Guaymas, and the news that he was off on one more trip to Tiburon excited no especial interest—for if he didn't get killed this time, why, *por dios*, he certainly would be killed next time, or the next, so there was no reason to be excited over the reckless Americano. But when it became known that the Señora of the party likewise was going to Tiburon, then there was a pretty dish of gossip set simmering and boiling—very much to the enjoyment of said Señora—as she peered into window panes in the quaint narrow streets of the charming little city to notice how becoming her new sombrero sat on her head.

"But never—*por dios*, never has a white woman ventured on Tiburon!" was declared, again and again.

"Which is the very reason I'm going!" replied the Señora. "For it's perfectly delightful to think I'll be the first white woman to land on Tiburon!"

Which conclusively settled the argument.

And half an hour after her *pronunciamento* we were aboard



La Señora overseeing the preparations for the start.

Wanderer, and, cheered by the people on the wharf, we started on our cruise. It was 11.30 A. M., April 20, 1911. The log book of the trip began then and there!

The first real entry concerns the boat, and a boat worthy of all loving and particular attention—if we had the space for it!—is the trim and able Wanderer! Built in 1907 in Maine, she is 47 feet 6 inches in length, with a 10 foot 6-inch beam, of 15-ton burden, and draws 3 feet 6 inches. She is built with a high free-board, carries a 25-horsepower Standard gasoline engine, a leg-o'-mutton mainsail, jib and small jigger

sail, and is thoroughly well equipped and fitted with all things essential, and many of the luxuries, for motor boating. She cruised in Atlantic waters from 1907 to 1908, and then went to the Great Lakes on her own power, and cruised on Lake Michigan for two years. Then Salisbury shipped her on a freight car by the Northern Pacific from Chicago to Seattle. She cruised in Alaskan waters during the summer of 1910, and then Salisbury—with his wife aboard—indulged in one of the most daring of all his daring exploits, for he took the Wanderer under her own power from Alaska to Guaymas, in Mexico, a little jaunt of some 3,000 miles, incidentally passing through one of the worst storms ever known on the North Pacific coast, during

which he never left the wheel on one occasion for forty-eight hours. Since then Wanderer—never was a boat better named!—has been as far south as Central America, and has visited virtually every port on the west coast of America, from Central America northward, including many trips for exploration and hunting and fishing in the same mysterious and romantic waters we now were entering.

We had filled the tanks to chock-a-block with gasoline, and carried spare five-gallon tins of it stowed away and piled on deck, to the amount of 300 gallons in all. The Wanderer can do about 10 miles an hour when pushed; but Salisbury proposed on this trip to do no unnecessary pushing, but to husband and utilize to the utmost every drop of gasoline. We would

get no more after leaving Guaymas until we returned; for there is no other town north of Guaymas. Navigation ceases there. Not even a lighthouse breaks the desert shores up and down either side of the Gulf, nor any sign of civilization save a gold camp or two, and a settlement attempted in bleak Lobos Bay. The Wanderer's engine runs normally at 350 revolutions, but Salisbury had found out that by keeping it at about 300 r.p.m. he could drive her along at about nine miles per hour, and save gasoline, and wear and tear. This was her most economical speed—and at that we used up about $2\frac{1}{2}$ gallons of the precious fluid every working hour.

The space not taken up by gasoline cans was pretty well hampered with provisions. But we took no meat, for we would depend on the hunting to keep our larder supplied, and as for fish—"Well, the Gulf itself is an ever-ready fish supply," said Salisbury. "We'll throw a line over whenever we want one—and there'll never be hard luck in these waters, I promise you!"

We passed out through the many-islanded, sun-drenched, mountain-surrounded harbor of Guaymas at noon. A light wind from the west was ruffling with white touches the radiant blue of the gently-swelling waves, and for 25 miles we skirted the shore in a northwesterly direction, until we rounded Cape Haro. We reached Morro Colorado late that afternoon, some fifty miles from Guaymas, where we laid our course for Tiburon Island, the exact course being northwest by west, one-quarter west, and the distance to Willard's Point, on Tiburon's southwest extremity, being about 80 miles.

That was a glorious afternoon! The Señora and I enjoyed every moment of it, and even the glory of the sunset that ushered in the beautiful sub-tropical night could not but make us regret the ending of that first day of enchantment. To push into any sea, in a snug motor boat, well-commanded, well-equipped, well-handled, seeking adventure and the delights of the open-air life, is a great experience; and no matter how often

Shortly after starting, Captain Salisbury gave the Señora a tip which impressed the unusual character of the experience upon her mind more than anything else that so far had happened, despite all the strange sights and sounds and stories she had been moving amidst ever since entering Mexico. For he told her that unless she used salt water, that washing one's face more than once a day was distinctly frowned upon. For if the water springs on Tiburon Island were low, as often happened, we might not find water anywhere on the trip, and every drop we carried was precious. Parts of the Gulf country are among the most arid deserts in the world.

"I've given the crew a lecture, too," said Salisbury. "But, pshaw! what's the use! It's hard to make the best of the Mexicans understand common sense on the water question, and it'll be a case of watch them all the trip." He grinned as memory brought back something funny. "One trip up here," he continued, "I had a Chinese cook, and gave him orders to save water. The Chink obeyed very literally! At dinner time I saw the crew spitting out their food and spluttering: '*Mucho saldo! mucho saldo!*' The Chink had used salt water to cook with." Salisbury turned to El Capitan, and asked him in Spanish if he remembered. A wide smile parted El Capitan's grizzled beard, and he spat vigorously over the rail, as he said: "*Por Dios! Mucho saldo! Si! Si! señor!*"

Here comes a note from the log book which, perhaps, for family reasons, I shouldn't dare to copy—but here goes! (2.30. Passing by the strange, fantastic shape of a monstrous lion crouching in the water—one of the many singular forms that the hills and rocks assume in this country, doubtless because of volcanic action. The land seems as if it had been carved according to Rodin's wildest designs, and then colored according to Maxfield Parish's richest scale of gorgeous hues! . . . Hum! Speaking of color, makes me take notice of the fact that the Señora has turned a weird yellow-green tone, and has retired with



it is repeated for the true motor-boatman it never grows stale. How can it grow stale?

For it is life—real life, vigorous, virile, vibrant with enjoyment! But to push into unknown seas—to have the added thrill of the feeling that you

are blazing a sea trail that soon must be followed by many others—to know that you are to enter places marked as *terra incognita* on the maps—well, for fear lest I wax too lyrical, I'll drop my poetical strain, instead of dropping into it, like Mr. Wegg, and repeat what I said in starting—this was some motor boat cruise, believe me!

We carried a crew of four hands. There was a gray-bearded old Mexican sailor we knew only as "El Capitan," who was Salisbury's constant companion on the Wanderer; a man who knew the Gulf as did no other native sailor along the coast. There was "Steve," an American miner, who was the engineer. The revolution has put Steve's mine out of commission just at the time when he was to sell it at a fat figure; but he did not grumble—much!—he swore a few swears at Madero and Diaz impartially, and hoped for better times by and by. Then there was a California Mexican named Ramon, who was our cook; and a Cuban boy who was our general factotum. They were devoted to the Señora's comfort, and determined to make the trip pleasant for her sake. A bully bunch, one and all!

Chief Juan Tomas and one of the Seri villages, showing how slightly this tribe has been touched by civilization.

a pillow to a place apart. Says Salisbury, in a low voice—but not low enough: "Sorry for your wife, old man! She doesn't seem to be enjoying herself just now. This blamed seasickness—" But an indignant voice from the Señora—now flat on her back—breaks in: "Oh, but I *am* enjoying myself! I'm having a perfectly lovely time!"

All about us were great flocks of giant pelicans, and scores of other varieties of wild fowl. And turtles went by every few minutes, swimming on the surface, or in the clear depths below. And seals, and sea-lions, and whales, and many kinds of shark. And red-snapper, breaking the water with vivid scarlet flashes; with now and then the leap and splash of the gigantix tintero, or stinging ray, that often runs to a ton in weight. We slowed up near sun-down and in two twos caught all the cabrillo—a species like a rock cod, running to huge sizes—that we cared to drag out of the water. Frequently when one of us was pulling in a fish, weighing, perhaps, twenty pounds, a monster cabrillo (we afterwards secured one, near Tiburon, that ran over six feet in length, and must have weighed over two hundred) would grab the little fellow, hook and all, and snap the line, and away!

On account of its gradually narrowing shape, and its position, the Gulf of California is just one great natural fish trap, and is certainly one of the best fishing grounds in the world;



The shore line in places resembles the Grand Canyon of the Colorado, which empties into the Gulf of California.

even as its shore forms perhaps the best of all hunting regions to be found to-day. They swarm with all kinds of game: puma and mountain lion, and grizzly, and brown bear, and wild hog, and big-horn sheep, and mountain goat, and elk, and deer of many sorts; to say nothing of duck and quail and other fowl.

Within the next few years this region is bound to become the happy hunting and pleasure grounds of American motor boatmen and hunters. For nine months out of the year—the exceptions being June, July and August, when storms prevail—the weather is ideal, being neither very hot, nor ever unpleasantly chill. There are plenty of good harbors and anchorages, and several points where water supplies can be developed, now that Salisbury has located the springs and has made his knowledge available.

At 6.15, as we were drinking in the wonderful beauty of the sunset, Salisbury pointed out something that gave us a thrill. It was the faintest discernable shape of purple across the water dead ahead, and he assured us that it was the loom of the high mountains of Tiburon, the mysterious!

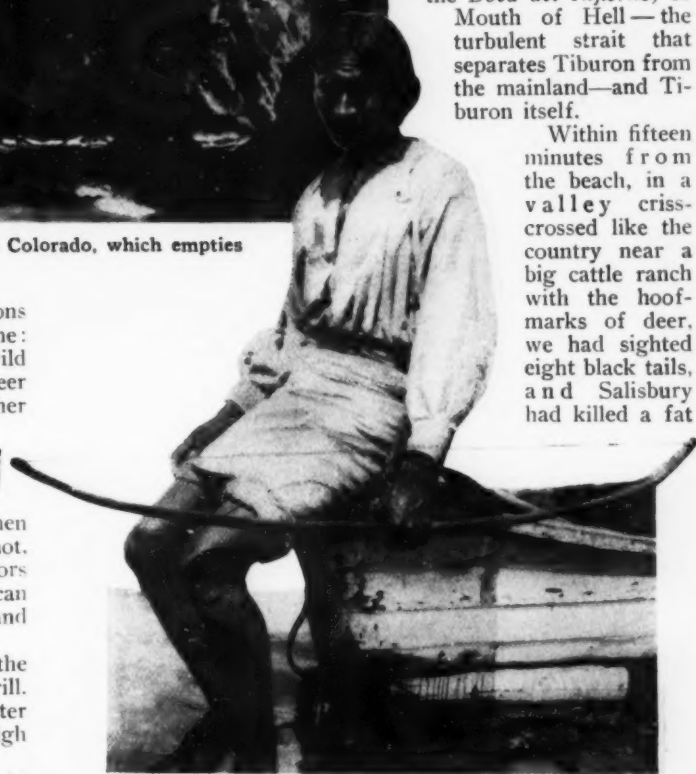
We proceeded on half speed through the night, so as not to make our land-fall on Tiburon much before dawn. Until about ten o'clock we kept on a west by north course, and then changed it to west by northwest, which would bring us to Willard's point, the southwest end of Tiburon. It was about fifteen miles farther to Willard's Point than it would have been to go to the nearest southeastern part of Tiburon, but Willard's was nearer to our objective point, namely, the main Seri village. I passed the night on deck, and stored away, never to forget, in the book of my most wonderful memories, the rise of the moon out of the phosphorescent water, broken by the dartings and leaping and trailings of big and little fish, and tinged with the reflection of the purple and sapphire, star-thronged sky.

At dawn, we—that is, the Señora and I—were awakened out of a light sleep to be told that we were passing Turner's Island, off the southern end of Tiburon, with Monument Point, the southeastern extremity of our objective, looming like a silhouette cut out of ebony against the dim beginning of the daylight. How hushed and still and silent was the shadowy world! Then a dim shape heaved itself along the water—the first of the pelicans, opening up the fishing business of the day. Then came a flock of them. Then moment by moment the light brightened, and the world grew out of shadow into glorious color, and the day was with us once again. And we were at Tiburon! We were entering a wide bay, without name on the map, but which Captain Salisbury then and there baptized as "Peggy's Landing," in honor of the first white woman on record to land on the island—for that was what happened fifteen minutes later, when we lowered the rowboat, and took the Señora and ourselves to shore, leaving El Capitan and Steve to guard the Wanderer, and taking the Cuban boy and Ramon with us, to carry spare guns, and our game—provided we secured any, for we had landed to get deer meat.

We gave three cheers as the Señora scrambled out on the rocky shore of the cove, and set her foot on Tiburon, marking the advance of the white femininity that, by and by, no doubt, will know Tiburon as it knows Bermuda, or the Catalinas, off California. She carried a very businesslike revolver strapped to her side—and insisted upon having her photograph taken right away!

Near where we landed were the ruins of an old Seri village, marked by turtle shells and oyster shells, and fragments of their cactus huts. This is one of their fishing places, as they live a roving kind of life, divided between their main village across the *Boca del Infierno*, or Mouth of Hell—the turbulent strait that separates Tiburon from the mainland—and Tiburon itself.

Within fifteen minutes from the beach, in a valley criss-crossed like the country near a big cattle ranch with the hoof-marks of deer, we had sighted eight black tails, and Salisbury had killed a fat



Another Big Gun (or, rather, Big Bow) of the tribe.

buck. So, as we did not wish to burden ourselves with more deer meat than we actually required, for neither the Señora or myself are hunters for the love of hunting, we spent the rest of our time at Peggy's Landing in making an expedition inland. Such a desolate, cactus-ridden, silent, strangely shaped and strangely colored place it is! We walked—that is, the Señora and I, at least—with our hearts not far from our mouths, expecting at any moment to see one of the giant Seris appear from behind a boulder or a clump of cactus; but Salisbury laughed at us, saying that he was sure from his knowledge of their habits that we should find no Seris until we reached the main village.

So, after a long tour of observation of the mysterious island we had landed upon, where the atmosphere, quivering with intense heat within the inland arroyos and canyons, seemed also to be vibrating with the legends attached to Tiburon, we returned to the Wanderer, and got under way again.

In fact, it was not until the next morning, after a wonderful day passed in other landings, and hunting and exploration trips here and there along Tiburon's bold and rugged shores, and after passing the night at Patos Island, where there was a very good anchorage (Patos itself being on the northwest face of Tiburon), that we came in touch with our friends, the Seris. We had traversed the thirty-odd miles of Tiburon's length, and had familiarized ourselves with nearly all the harbors and coves and valleys that break its western face. This made our approach to the Indian village come so late in the day that we decided to stop at Patos Island, and make our call with the morning light. And, so, just as the morning light was strong, we left Patos, and quickly made the fifteen-mile run to the mainland, where at about 8 o'clock we spied the Seri villages clinging to the sand of the open roadstead like giant gull's nests, and saw the Seris themselves wildly dashing toward their canoes as we came up, with all our flags flying in honor of Juan Tomas, their chief—and Salisbury's good friend.

(To be concluded.)

MEASURING



THE measurement of motor boats necessary to handicap them according to the universally used American Power Boat Association rules, is not nearly as difficult a task as it is generally assumed to be by the majority of motor boat owners; neither is a thorough knowledge of higher mathematics necessary. Likewise the tools required to do the work are the simplest. In fact anyone willing to take a little care and apply about the same amount of common sense can perform the operation in a satisfactory manner.

The fundamental object of every rating rule is an attempt to determine a boat's speed by making a few simple measurements of the boat's dimensions and power and applying these to the principals that underlie the theory of resistance and propulsion. The value of the speed figure arrived at by this application should naturally be a maximum, that is, the speed which a given boat should be capable of when everything is working to the highest degree of efficiency. No allowance can be made, of course, for a departure from this maximum speed due to, perhaps, an incorrect wheel, poor compression, excessive engine friction, dirty or rough boat bottom, crooked course, or the hundred or other irregularities that should not be present to obtain the best results.

How near any of the existing rating rules approach the average boat's speed is a matter of much difference of opinion, but if a careful study is made of the performance of a large number of boats in a race, as many races are conducted to-day, many points can be discovered other than a defective handicapping rule that tend to bring forth such a large difference in the corrected times of the competing boats.

The American Power Boat Association rules, which have been almost universally used for the past several years, are noted for the excellent results they produce in handicapping boats of a type other than those built especially for racing purposes. Good, wholesome, everyday boats that are useful for cruising and pleasure purposes, as well as a little racing on the side, are the kind that these rules work out most satisfactorily for. However, on the other hand, cases are very frequent where boats are built especially for the racing game and to "beat the rule" and their success at the latter is very striking. The rule becomes worse than useless and the races where such a type of boat is competing become hardly more than a joke. It is sad to note that such boats are on the increase and may soon become the rule rather than the exception, so that the future of racing under the present rules may be seriously threatened among amateurs unless some means are devised to better classify the boats.

The finishes are, in general, the closest when boats are divided into classes such that the ratings of all the boats in each particular class are quite close—that is, do not expect the rules to work out the best when a boat with a rating of 50 is matched against one rating 30.

The characteristics of a boat that are used to determine its speed are:

- (1) Length on load water line.
- (2) Cross-sectional area below the water line.
- (3) Horsepower of the engine.

Of course we all know that the more cross-sectional area a boat has the slower it will go through the water, other things being equal, consequently we should expect the rating rule to give the boat with the large midship section more handicap than the smaller,



By C. F. Chapman

Measurer of the New York Motor Boat Club.

If you belong to a motor boat club, you are undoubtedly interested in racing and consequently in the rating of your own craft. Realizing this and the fact that measuring and rating, although of vital interest, are but little understood by the average boatman, Mr. Chapman has written the following article and has presented the subject so clearly and in such an interesting manner, that you will be surprised how simple it all is after all.—Editor.

or, as we express it, the boat with the larger section would rate the lower. Strictly speaking, the boat's displacement and the degree of fineness of its lines should be used to determine its speed, but to use these factors such complications would immediately arise that they would be out of the question and entirely unnecessary for our desired result. Instead of these the area of the midship section, an easily determined factor, is substituted.

The approximation is close for the average run of motor boats, excepting where they are designed especially to "beat the rules," the greatest deviation being in the speed boats which are easily weighed and the displacement obtained directly.

Similarly the boat with the greater horsepower, other things being equal, should go the faster, rate higher and have less handi-



Lining up the end of the stern with the plumb line and reading the over-all length on the tape.

cap than the boat with less power.

The boat's length on the water line is also a factor which its speed depends upon, although not to as great an extent as its displacement and power. Yet within reasonable limits the longer a boat is for a given power and displacement the greater will be her speed.

The three above factors are applied as follows:

Speed (nautical miles per hour)

$$= 4.32 \sqrt[3]{LWL \times \frac{HP}{MS}}$$

or, as it is generally expressed:

$$\text{Rating} = 18 \sqrt[3]{LWL \times HP \times MS}$$

and speed in nautical miles per hour = rating $\div 4.167$ —for example, a boat that is 64 feet long on the water line having a cross-sectional area of 3 sq. ft. and a 24 horse-power engine should go 17.28 nautical miles an hour and will rate 72.0.

Theoretically, within certain limits, two similar boats built from the same lines but having a different amount of power installed, should vary in their speed about as the cube root of their respective powers. For example, suppose the first boat has a 3-horsepower engine installed and is able to make 5 miles per hour, and the second has 24-horsepower, then the ratio of speeds of the two boats should vary approximately as the cube root of 24 divided by 3, which is 2; that is, the second boat should make 2×5 or 10 miles per hour with 24-horsepower, other things being equal. We should, therefore, expect the first boat to have a handicap corresponding to the difference in the speeds of the two boats which in the above case resulted solely from the difference in the power of the engines.

By an inspection of the formula given above to determine speed it will be seen that the speed varies as the cube root of the power. But what does the power depend upon? The power that is generated within the cylinder of the engine depends upon four things:

The average pressure within the cylinder during the cycle,

The length of the stroke,

The bore of the cylinder,

The revolutions per minute.

To determine the true horsepower it would be necessary to obtain correct values of each of the above, two of which—the bore and stroke—are easily obtained, but the other two—average pressure and revolutions—are very variable and hard to obtain satisfactorily. To take care of these variables one factor is introduced in the formula for determining horsepower, which represents the average value of a large number of observations of average pressure and revolutions taken on marine gasoline engines. A different constant is required for two and four-cycle, as different average pressures are produced within the cylinder by the different cycles. The power is directly proportional to the number of cylinders, hence it is simply necessary to determine the power of one cylinder and multiply this value by the total number of working cylinders.

For engines, both two and four-cycle, having a stroke of six inches or over it has been found most satisfactory in determining their power for handicapping purposes to include also a value for the stroke in the constant, which, as explained above, takes care of the variable quantities, average pressure and revolutions. In other words, the power of engines

having a stroke of 6 inches or over depends solely on the bore and number of cylinders. This necessitates four formulæ for determining power, which are as follows:

	H.P. 2-cycle	H.P. 4-cycle
Stroke less than 6" .0553 $N A S^2$.0556 $N A S^2$
Stroke 6" and over .404 $N A$.3333 $N A$

In the above N = number of cylinders

A = area of one cylinder, sq. ins.

S = length of stroke in inches.

As it is easier to work with cylinder bore or diameter than with area the following formulæ will be found useful:

	H.P. 2-cycle	H.P. 4-cycle
Stroke less than 6" .0513 $N D^3 S^2$.0436 $N D^3 S^2$
Stroke 6" and over .3173 $N D^3$.2618 $N D^3$

The above formulæ are applicable for determining the horsepower of engines in all types of boats except what are termed "racing boats," or as they were formerly called "automobile boats." An automobile or racing boat is defined as one whose rating exceeds twelve times the square root of its load waterline length. For example, a boat having a length of 36 feet on its waterline must rate over 72 to be known as a racing boat. For racing boats the value of the horsepower to be used in determining their rating is one and a half times that given in the above formulæ. Should a boat fall in both the racing boat and cruiser class by reason of the difference in horsepower, it is then termed a racing boat. Obviously two ratings must be worked out for each boat using the two horsepower methods, in order to determine whether she is a racing boat or not, but an easier way to follow is to work out her rating assuming that she is in the cruiser class and then multiply this value by $\sqrt{1.5} = 1.15$ which will give her rating as a racing boat and an inspection of the two results will quickly show which class she falls in.

When these formulæ for horsepower were first adopted the development of the marine gasoline engine was such that constants could be logically introduced to care for the two variable factors. The difference between the maximum and minimum speed was not great, consequently the error small, but unfortunately conditions have changed. To-day there has not been much change in the piston speed of the engines that are found in the cruisers, but that in the high-powered racing boat has gone up with leaps and bounds. Imagine trying to rate an engine turning 500 with one turning 1,500-2,000 revolutions per minute, assuming as the rule does, that the power is independent of the revolutions.

Racing men have taken advantage of this fact and installed high-speed engines with a small bore and stroke, in some of which the rated power under the rules can hardly be one-quarter of their true power. The results brought about by such a rule are fatal as well as ridiculous. If a horsepower rule must be used that eliminates the revolutions, then why not make the power proportional to the cylinder

diameter rather than to its area. As it is now the engine with one-half the diameter rates only one-fourth the power, while, as a matter of fact, with the increased revolutions of the small bore engine, her power is far in excess of this ratio.

These methods of juggling are not by any means restricted to the "racing boat" class. Similar results can be produced in the rating of cruisers, although perhaps not so marked by the use of high speed, small bore and stroke engines.

The method of determining the area of the midship section is another approximation which is very close to the true value in the average boat, but a point on which consider-

is benefited. The area of any form of midship section between these two extremes approaches the area as determined by the rule. The waterline beam ($B W L$) is divided into five equal parts, and at the first in board section (A) a perpendicular (H) is dropped to the outside of the planking. The length of H in feet or fraction thereof is the draft, and this value multiplied by $B W L$ in feet gives the area of the midship section (square feet).

For successful measurement it is an absolute necessity to have quiet water. An error of an inch in the most important measurement, the draft, may mean the loss of a race or winning it unfairly. A low float is the most convenient to work from, although in its absence a dinghy will do.

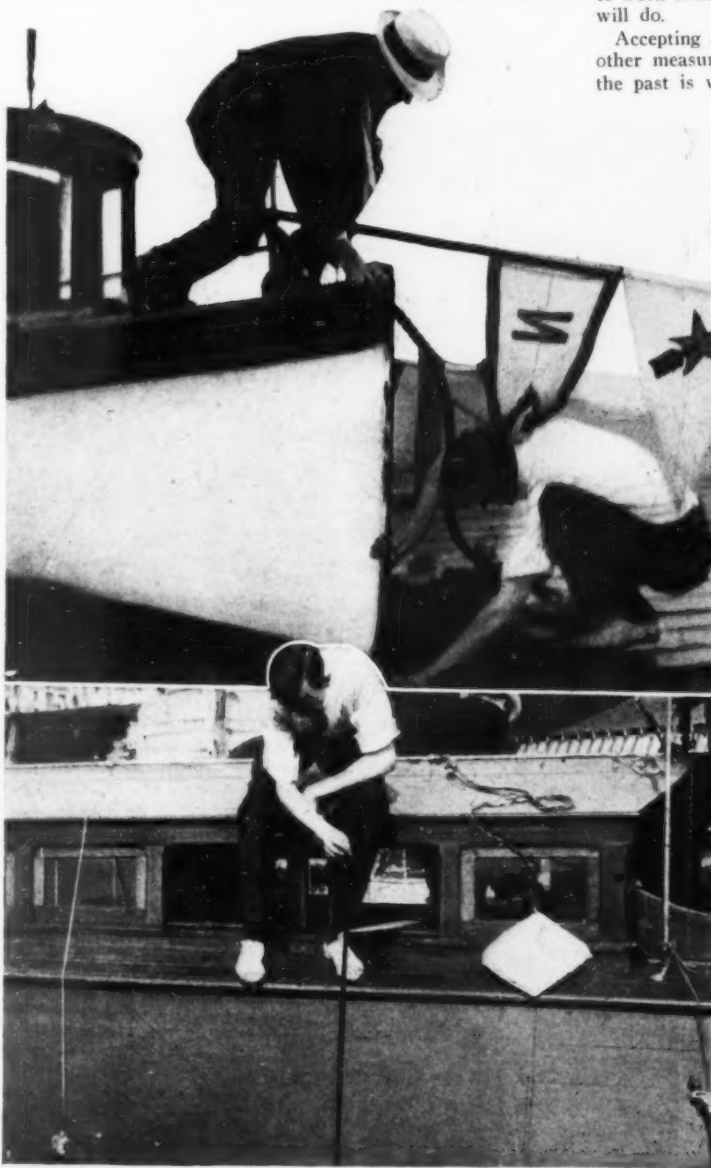
Accepting certificates of measurement from other measurers or those made some time in the past is very bad practice, especially if it is not known in what trim the boat was when last measured. It is an absolute fact that the rating of a boat is very considerably altered by change in trim. It is seldom the same to-day as it was yesterday. The writer measured one boat three times this season to notice the effect of changing the position of the ballast, etc., and the rating changed nearly 10%; in this particular case it made a difference of about twelve minutes in the time allowance in a thirty-mile race, and so for absolute accuracy it is necessary to measure a boat immediately before the start of the race and have her in the same trim as she is to be in the race.

Boats while being measured, except the "racing boat" class, should have on board the entire crew that she is to carry, and a weight equivalent to all the fuel, supplies and equipment necessary for the entire trip. On the other hand, the bilges should be free from water and the boat should have on board nothing that she is to put ashore before the start of the race.

The tools for the actual measurement to obtain the boat's rating need be only the simplest. In fact, as accurate results or perhaps even more accurate results can be obtained with them than with the most delicate and complicated apparatus. All that is needed is a steel tape, preferably divided into tenths of a foot rather than inches, a wooden straight-edge, a little longer than the extreme beam of the boat, two shorter straight-edges, about one inch by one inch, a small spirit level, a couple of clamps and a foot rule.

The first measurement to be taken is the overall length, which, as the name indicates, is the distance between the foremost and the aftermost part of the hull taken in a straight line. The plumb lines will be of assistance in taking this measurement to avoid obstructions on the deck, etc. (See pictures on opposite page.)

Next obtain the overhang at the bow and the stern by dropping the plumb lines down into the water from the points to which the overall length was measured. By means of the foot rule obtain the distance along the surface of the water from the plumb line to the point where the hull proper intersects the



Above: Measuring the distance between the intersections of the stem and the plumb line with the water to obtain the forward overhang.

Below: Measuring the "beam over all." Plumb lines are dropped just touching the extreme points of either side and the distance between them is read on the straight edge, shown projecting from the window.

able juggling is possible by one trying to "beat the rule." In Fig. 3 (to follow) the shaded section shows the area that the rule determines and the unshaded portion shows that part of the true section that is neglected. It will be noticed, however, that about as much of the shaded section extends beyond the line of the planking as there is unshaded within, consequently one about offsets the other. The reason for employing this method of arriving at the area of the midship section is simply because it would be next to impossible to obtain the true area easily. A form of midship section approaching a triangle is penalized by this method while one approaching a trapezoid

water plane. (See picture.) The rudder or stock should not be considered part of the hull proper. The sum of these overhangs at the bow and the stern subtracted from the first measurement, the overall length, will give the load waterline length.

The next step is to determine at what point the overall beam is to be taken. The rule says that it shall be taken at the point of greatest midship section, if this be known; if not, at a point 55% of the L. W. L. aft of the bow. If the owner does not designate a point at which he desires you to take the beam and later the section, the 55% point should be located by multiplying the L. W. L. previously taken by .55. To this product the overhang of the bow to be added and a distance equal to this sum should be measured aft from the extreme bow in a straight line and the point plainly marked on the deck or other suitable part of the boat.

The long, wooden straight-edge should be placed athwart ship at this mark projecting a little over each side of the boat, care being taken to have it firmly fastened in place at right angles to the fore and aft line of the boat and parallel to the water when the boat is on an even keel. This latter fact can be ascertained by placing a spirit level on some portion of the boat, such as the floor, which is known to be true, and slightly shifting ballast until the boat shows level. In the absence of a spirit level hang the plumb line from the bow and line it up with the bow line from the

the half-round or rubbing strake. Measuring between the two plumb lines with a steel tape will give the overall beam.

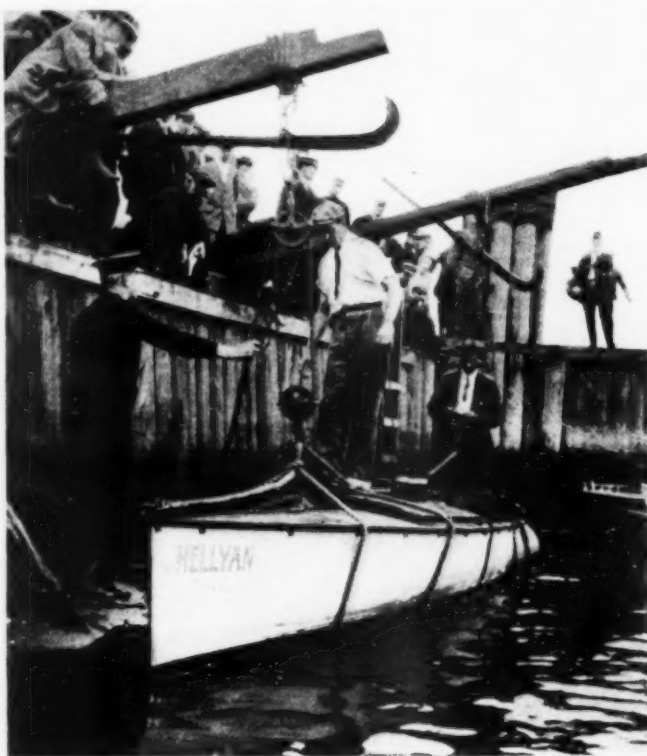
Next get the overhang at each side by measuring the distance between the outside of the planking and the plumb lines which are still in the same position as when taking the beam meas-

most difficult to obtain correctly and perhaps the most important measurement. As we have previously seen, it must be determined at a point one-fifth of the waterline beam inboard. Therefore, divide the waterline beam measurement by five and this quotient locates the point that the draft is to be taken at. To this amount add the overhang on one side which will represent the distance inboard from the extreme outside of the boat, or, in other words, the distance from the plumb lines from which the overhang was measured.

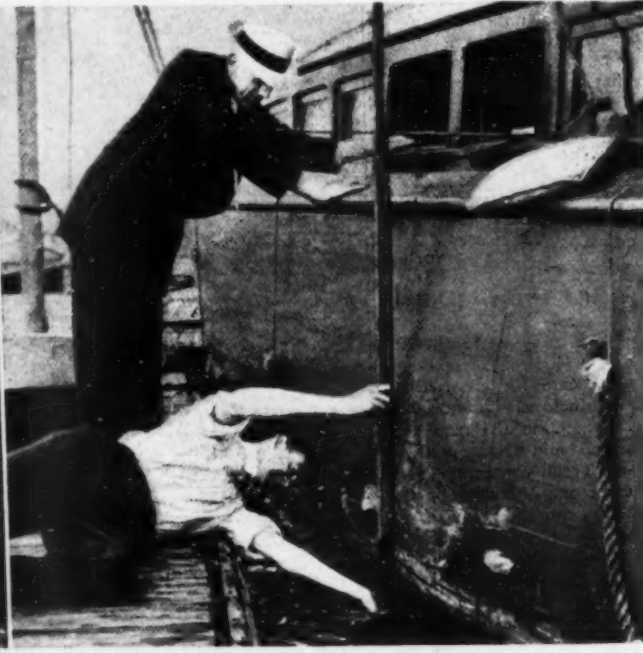
Referring to Fig. 2 to follow) will make this clear:

BOA = the beam overall
 aa' = total overhang
 BWL = beam on the waterline
 b = $\frac{1}{5}$ of the BWL
 c = $\frac{1}{5} BWL +$ overhang = $b + a$
 d = the draft

To obtain the draft at the above-mentioned point the two short wooden straight-edges, e and f , are clamped together at right angles so that the end of e is at a distance from f equal to $\frac{1}{5} BWL +$ the overhang on one side or at a distance equal to c . Lower e down into the water until the inner end of e is just in contact with the boat's planking and the inner edge of f is in line with the plumb line g . The point where the water intersects stick f should be marked with a pencil and then e removed from the water and the distance from the mark along f to its junction with e should be measured and will be the amount of draft. (See pictures.) If the stick f ,



Weighing a speed boat; two scales may be used and the weight obtained by adding the results.



Obtaining the draft. The perpendicular stick is clamped to the horizontal one at a distance along the latter equal to $\frac{BWL}{5} +$ the overhang on one side. It is kept plumb by lining up with the plumb line which is shown hanging from the straight-edge.

deck to the water until the two lines appear to coincide.

To get the overall beam, which is the next step and must be ascertained in order to get the waterline beam and finally the area of the midship section, the plumb line should be hung from the athwart ship straight-edge down into the water so that they just touch the outermost portion of the boat, which is generally

urement. Do not assume that the overhang will be the same on either side and hence only necessary to take it on one side and double this amount for the two sides. The difference found between the overhangs on the two sides will be very astonishing. Subtracting the sum of the overhangs on the two sides from the overall beam will give the waterline beam.

The next measurement, the draft, is the

from e up, has been previously calibrated the draft may be read off directly.

Multiplying the draft measurement expressed in feet and fractions thereof by the waterline beam expressed in the same units will give the area of the midship section in square feet and is the last measurement to be taken on the hull.

PART II.

The particulars of the engine should next

be ascertained—the bore, stroke, cycle and number of cylinders should be noted. Generally an owner's word can be taken for the bore and stroke but the measurer should carefully inspect the power plant and should he have the slightest reason for doubt about any of the particulars he should check up the owner's statements even at the expense of removing engine heads or taking an engine down entirely. Cases have been known where an owner has had the cylinders of a stock motor bored out an eighth of an inch or more just to obtain more power when racing.

The horsepower of the engine is worked up from one of the formulæ previously given or read directly from tables I or II (in the next installment) not forgetting to multiply by the total number of working cylinders.

Tables I and II have been worked out for values of horsepower with various bores and strokes. These should be valuable data both to measurer and those intending to purchase an engine for racing purposes, giving them a line on how engines of different bores and strokes will rate.

The keeping of the measurement data is a very important point. The actual notations made while measuring should be kept in a neat form and preserved for future reference. A good form to have this in is shown herewith under the head of "Measurement Data" and a typical case is entered on the sheet with the actual measurements. The calculations are carried out in detail and the results entered in their proper places. A convenient way to do is to make a tracing along the lines suggested on the "Measurement Data" sheet and strike off a few white prints and then fill in the measure-

ments while actually doing the work of measuring.

The "Certificate of Measurement" cards should be made out by the measurer for each boat measured, one to go to the owner of the boat, one to the secretary of the club in which the boat is enrolled and one for the measurer's own files. All the particulars of measurement, with the horsepower of the engine, rating, date and place measured, together with the signature of the measurer, should be contained thereon. A good example of a measurement card is as follows:

CERTIFICATE OF MEASUREMENT.

Name of boat.....	Club
Owner	Address
Length: overall.....ft.	Water line.....ft.
Beam: overall.....ft.	Water line.....ft.
Draft at section.....ft.	Area of M. S.....sq. ft.
Engine: Make.....No. of Cylinders.....	Bore.....Stroke.....
Engine cycle.....H. P.....	Rules.....
Rating	Rules 19—
Date and place of measurement.....	
Measurer's signature.....	

The measurement of what we defined as "racing boats" is somewhat different than the process just described for cruisers. The chief difference being in the manner of obtaining the area of the midship section. Racing boats must be weighed and then the area of midship section equals weight in pounds

$$\frac{L W L}{\times .0284, \text{ or if she is to race in fresh water } .0291 \text{ is used instead of } .0284.}$$

Otherwise the rating is determined in the same manner as for cruisers, except that the horsepower for racing boats is 1.5, that given by the formulæ, or in the table, as previously mentioned.

Weighing the boats is very simple. A couple of strong timbers are made fast to and projected from any wharf, bulkhead or wall. Common steel-yards or beam scales are fastened to the end of the timbers and a block and fall hooked to the steel-yards. Two slings, made of either rope or canvas, are placed around the boat so that she balances well, and

made fast to the lower end of the block and falls. She is then hoisted without crew aboard until she clears the water and the sum of the two steel-yard readings will give her true weight after the weight of the blocks and falls have been deducted. This weight plus 300 pounds, which is added to make allowance for the crew not being on board when "weighing in," is the amount to use in figuring the area of the midship section as described above.

(To be concluded.)

The Rival 35-Milers.

The New Class "Dixie Juniors" and the "Elco-Planes" which Mark a New Epoch in the Building of Speed Boats—What These Little Hydros Are Like.

ABOUT a year ago the announcement that the new Sovereign was to have a guaranteed speed of thirty-five miles an hour caused some little stir in the yachting world. Sovereign is a 165-foot steam yacht and is undoubtedly the fastest of her kind.

This year promises of the same speed for the 20-foot Dixie Juniors and the 20-foot Elco-planes not only mark a startling stride in hydroplane construction, but are significant in that they herald a trend in the industry that, we believe, is destined to lead it, Moses like, out of its present somewhat chaotic condition to a "promised land" long since attained by the automobile trade. How this is to be brought about, we shall discuss in a later issue; just now, let's talk about these little 20-foot prodigies.

Mr. Crane in the past has been content with quality alone in producing at intervals Vingt et Un, Challenger and the Dixies, I, II, III and IV, but this year, becoming more prolific, he is already about to present us with a whole litter of fast ones. But this isn't all. Happening in at Bayonne, recently, we were informed that the stork had also visited the Electric Launch Company, and the new 20-foot Elco-plane, the forerunner of another class of 20-footers, is also guaranteed for 35 miles.

Both the designs are, of course, hydroplanes, the Dixie Juniors slightly resembling Dixie IV and the Elco-planes, practically an enlarged edition of the famous Bug, Mr. A. E. Smith's 16-footer. With one exception, however, they are radically different in design and consequently we had better consider them separately. The one point of similarity is the arrangement of the engine aft of the steersman's cockpit, a point that those who watched last year's designs might have predicted. A noticeable feature of practically all of the successful hydroplanes of the season, was the placing of the engine, the principal weight, as far aft as possible. On the larger boats it was

By Wm. Washburn Nutting

It wasn't long ago that the buying of a racing boat was a speculation, attractive to some perhaps for that very reason, but hardly so to the man of limited means. We are entering upon a new era, however, for now it is possible to buy guaranteed speed and guaranteed service instead of a doubtful combination of hull and engine. Probably the most striking evidence of this advance are the new class 20-footers described in this article.

comparatively easy to crowd in a cockpit aft of the engine compartment, but on the little ones this is not practicable. The space required by the steersman is about the same in a small boat as in a large one and, therefore, is a much bigger consideration in the smaller boat; and that's the reason for the new arrangement. Of the two, the crew weighs less than the engine and this year they have changed places. This arrangement, besides producing better trim, gives the man at the wheel a more comfortable position from which to handle the boat, as he can neither be asphyxiated by the gases of the exhaust, nor drowned by spray—the unpleasant possibilities of the after cockpit.

With the motors installed so near the stern, it follows that the shaft angle would be too great to allow of a direct drive, and in both the designs the drive is forward to the propeller shaft which is thus installed at a much gentler angle.

THE DIXIE JUNIORS.

Several of the Dixie Juniors already have been completed by the Staten Island Ship Building Company. They are exactly 20 feet over all, by 4 feet, 6 inches beam, and are built with the same care and materials that this firm put into Dixie IV. The frames and floors are of elm, with yellow pine plank-sheer and mahogany planking. The latter is in two layers with canvas between and the

same construction was used on the three bulkheads. The construction of these little boats is substantial throughout and has not been sacrificed in the least to attain speed.

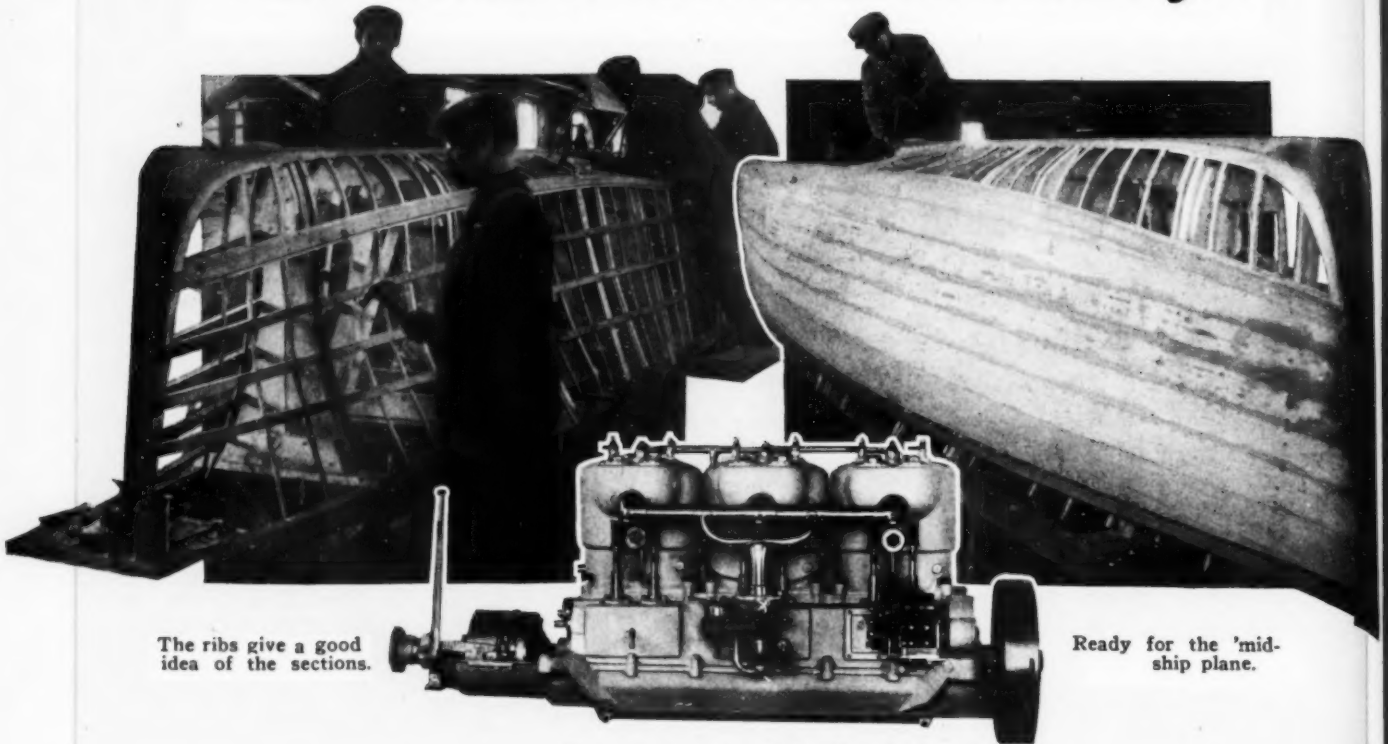
The interior arrangement consists of a compartment forward covered by a deck without openings, the steersman's cockpit amidships with a cross-seat for two persons, aft of this the motor compartment covered by swinging hatches, and in the stern a small engineer's cockpit.

The motors are special six-cylinder Sterlings of 5½ in. bore and 6 in. stroke, and rated at 45-65 h.p. These engines are stock models with a few slight changes to adapt them particularly to the hard service to which they will be put. The cylinders are cast in pairs and these, together with the valve seats, are thoroughly water-jacketed. All gears, the camshaft and, in fact, every vital part of the motor, is covered, although easily accessible. The reverse gear is of special design and is placed in an extension of the base, and another special feature is the water-jacketing of the oil reservoir and the carbureter. The ignition system is of the Bosch two-spark, dual type.

Although rated at 45-65 h.p., these motors will develop about 85 h.p. at 1,000 revolutions and better than 95 h.p. at 1,200 r.p.m., and the fact that they have been chosen by Mr. Crane to make good his 35-mile guarantee is sufficient recommendation that they are able to "deliver the goods."

Before leaving Dixie Jr. let's take a look at her underbody. An idea of this may be obtained from the photograph. The bow is fine, almost of the displacement type, with plumb stem and considerable flare near the deck. Several feet from the stem the hard bilges begin to take form and extend aft to the transom. About amidships these chines take an upward curve, reversing to a downward angle a little farther aft. (See the photographs.) The forward plane is "built up" beneath the forward planking, filling in the hollow and

The Construction of Dixie Jr.



The ribs give a good idea of the sections.

Ready for the 'mid-ship plane.

The 45-65-h.p. six-cyl. Sterling that is to drive her 35 miles an hour.



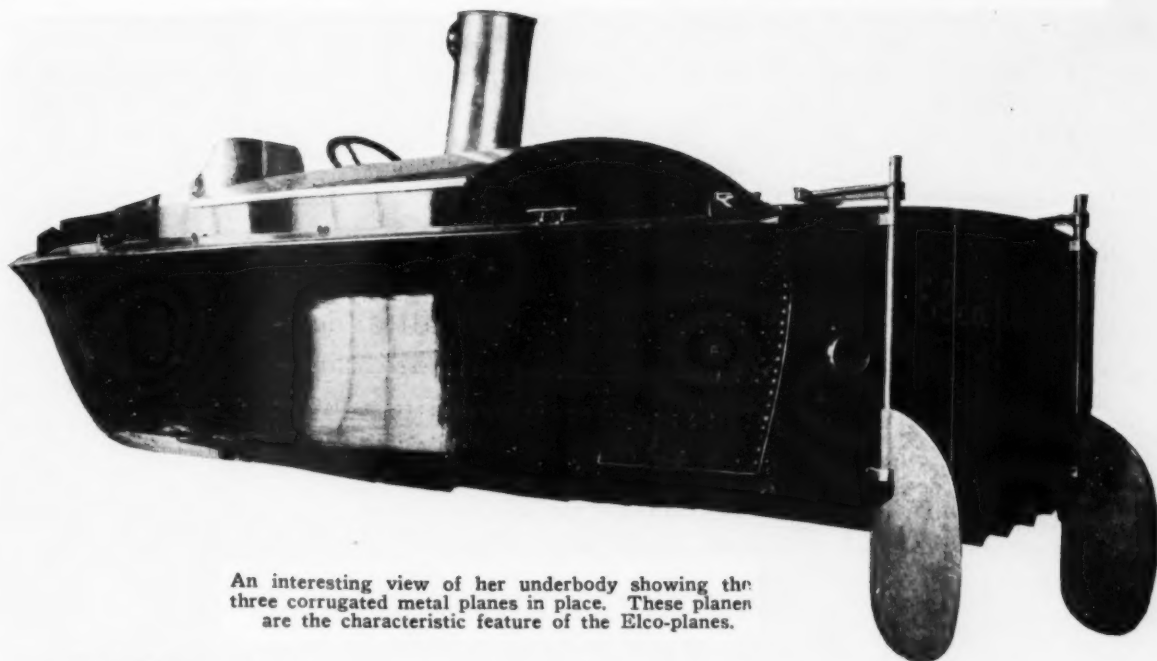
With plane in place showing step a little abaft amidships.



Applying the second layer of planking. Note the curved chine and the support for the built-up plane.

Photographs by Levick.

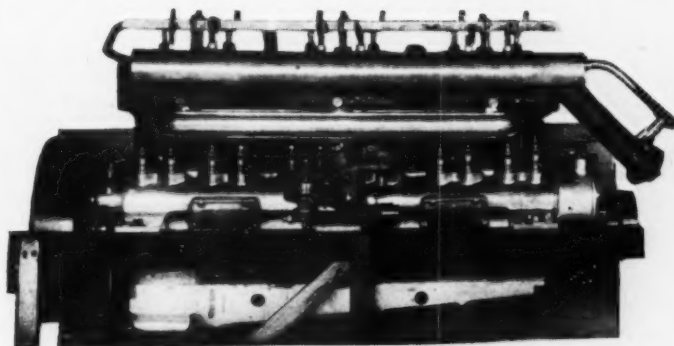
First of the 20-Ft. Elco-Planes



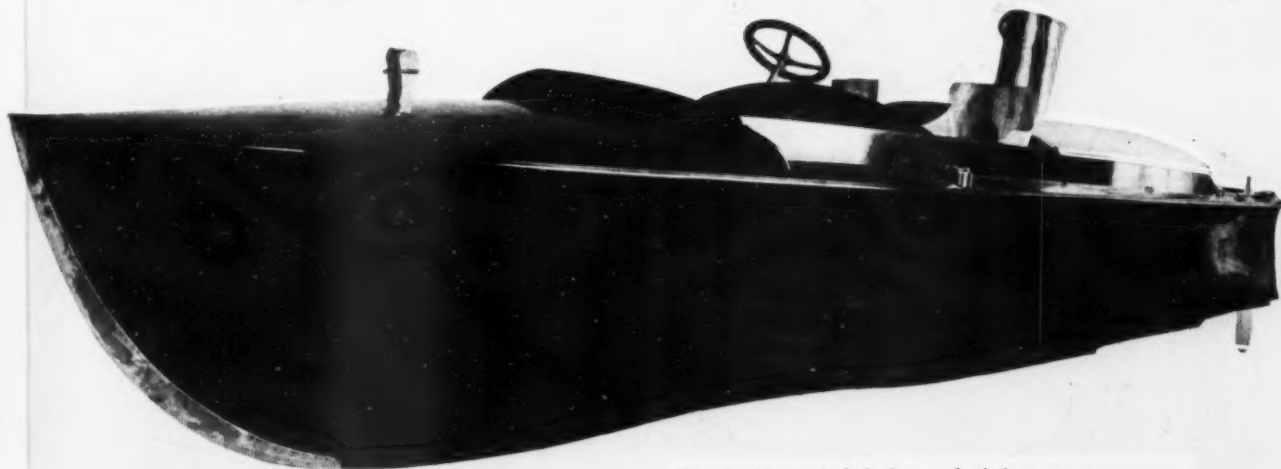
An interesting view of her underbody showing the three corrugated metal planes in place. These planes are the characteristic feature of the Elco-planes.



The flare of the sides extends the entire length of the hull, greatly stiffening the structure.

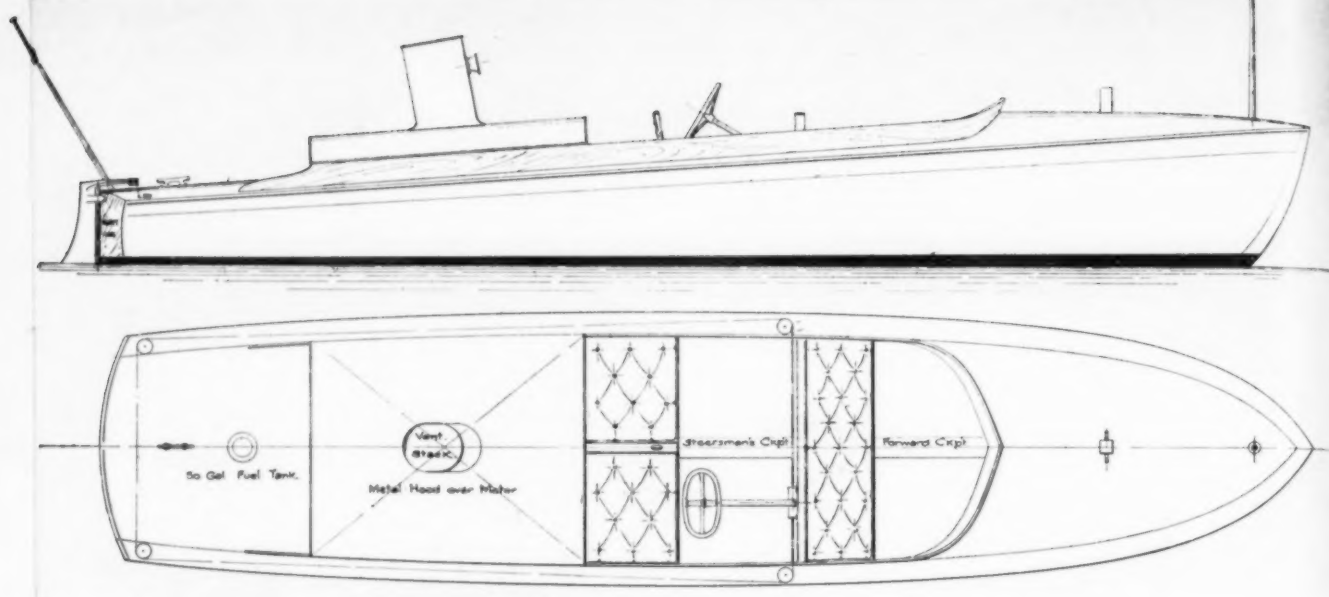


The 60-horse six-cylinder Elco has been chosen to make good the guarantee of 33 miles.



The double cockpit is forward of the motor compartment and will seat four persons. Note the curve of the chine, another characteristic feature

Photographs by Levick.



The 20-foot Elco-plane has a double cockpit forward with seating capacity for four persons.

ending in an open step at about the point where the downward curve begins. The bottom is V-shaped, the obtuseness increasing toward the flat stern and with the sides of the V somewhat concave. The Dixie Juniors are to be sold for \$4,500 completely equipped.

THE ELCO-PLANE.

Now let's take a look at the Elco-plane. One of these boats has already been completed and was exhibited by the Electric Launch Company at the show. She is 20 feet over all by 4 feet, 6 inches beam and 18 inches draft. Like the Bug, she is a tri-plane or two-step hydroplane with the peculiar fluted planes that characterize the latter.

The planes are somewhat V'd and the corrugated construction is thoroughly original with Mr. Chase, of the Elco Company. This construction is exceedingly strong, prevents skidding on the turns and allows a better distribution of air back of the step than possible by means of the usual method. It has the further advantage when the boat is traveling at high speed, in smooth water, that several corrugations on either side rise above the surface, decreasing the wetted area by maintaining a new bilge line—a condition obviously impossi-

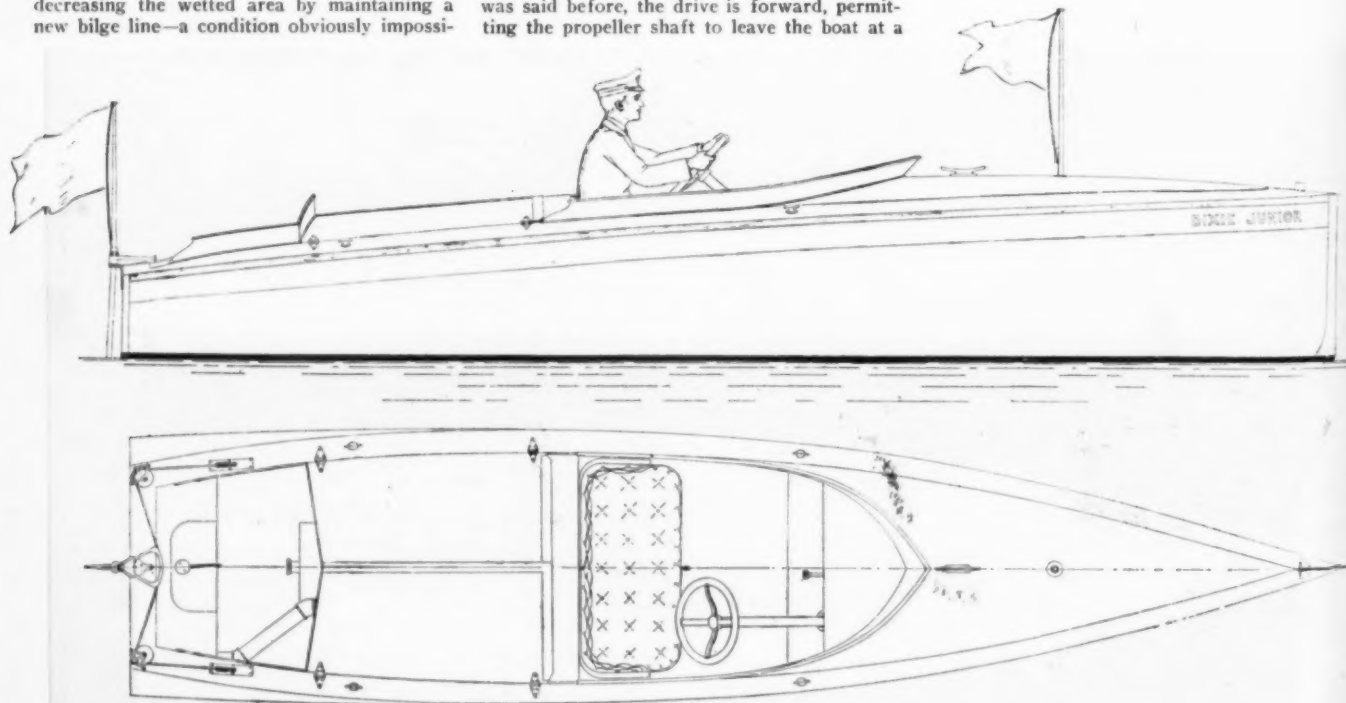
ble with the usual V-plane—as no matter how far the latter rises, the water, driven to either side, touches the bottom as far as the bilge. On the whole it has been conclusively demonstrated, both by tank experiments at Washington and the Electric Launch Company's experience with Bug and other boats, that the several advantages of this corrugated construction far outbalance its slightly increased wetted surface. These tests on Bug were run under varying conditions of weight, power and position and angle of planes, and the new boats are identical with the set of conditions giving the best results.

Little need be said of the construction of these boats. The fact that they are of the usual Elco standard is sufficient. The sawed frames and keel are of oak with yellow pine stringers and engine truss, and mahogany planking, decks and interior finish. The cockpit is amidships and provision is made for seating four people on two thwartship seats. The steersman's seat is the after of the two, and somewhat higher, and the spark and throttle controls, clutch lever and safety starting crank are all brought to this position. As was said before, the drive is forward, permitting the propeller shaft to leave the boat at a

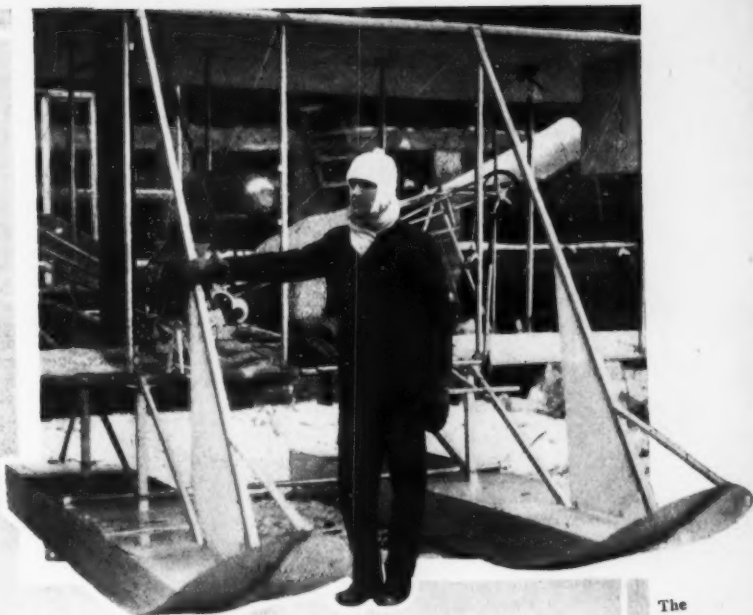
very moderate angle, insuring the highest propulsive efficiency.

A novel feature of the boat is the chain transmission giving two propeller speeds. A 1 to 1 ratio is employed in starting, and as soon as the boat planes, a 3 to 4 ratio is thrown in, as it has been found impossible otherwise to obtain the maximum efficiency from a wheel with low enough pitch to allow the engine to develop the power required to bring the boat to the planing point.

The motor of the 20-foot Elco-plane is a 60-70 horse, 6-cylinder Elco. It is installed under cover aft with a stack ventilator, and as the motor is designed to run without any attention, and is entirely controlled by the steersman, it is unnecessary for anyone to sit in the engine compartment. The boat is so substantially built that she may be swung from the davits of a yacht and, in fact, it is the intention of her builders to produce a class of boats to this design that will be popular as yacht tenders and fast runabouts, as well as for mere racing purposes. The new boats will sell for \$4,000 completely equipped.



The Dixie Juniors are arranged with a second cockpit in the stern for the engineer.



The pontoons are of aluminum and are so shaped as to slide over the water like a hydroplane.



Frank Coffyn and the Wright hydro-aeroplane with which he has been startling New York. The machine is capable of extended flight as an aeroplane, with the added ability to alight on or leave the water and to skim along its surface as shown in the lower photograph.

How to Design a Motor Boat.

Drawing the Lines—The Second of a Series of Four Articles Presenting the Fundamentals of Motor Boat Designing in the Simplest Non-Technical Terms.

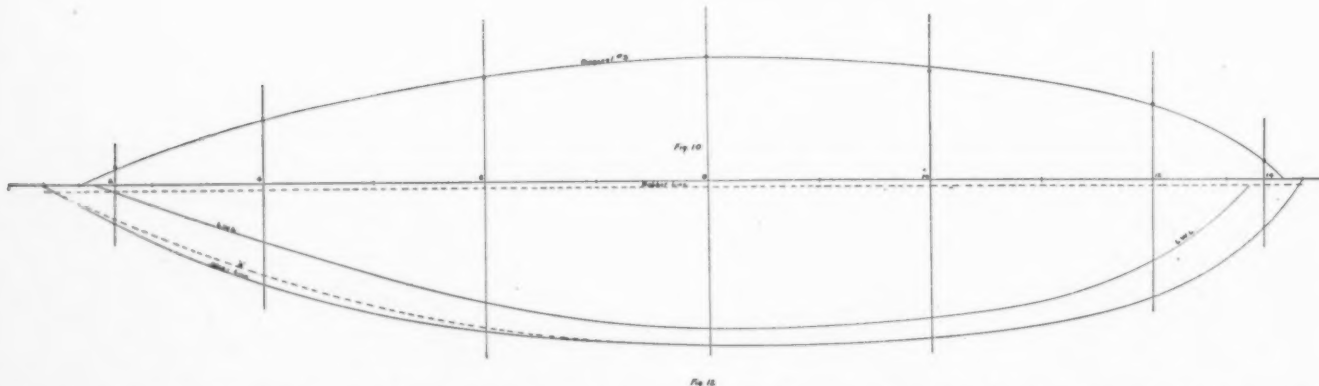
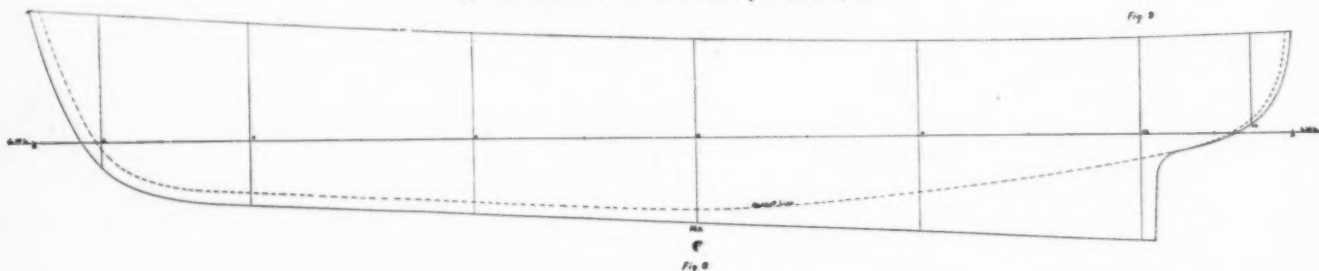
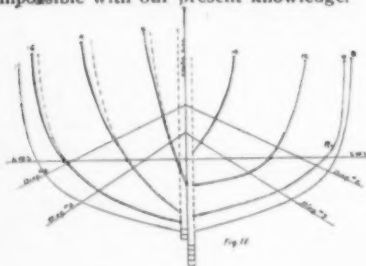
By L. B. Chapman.

WE now come to the most interesting part of our study—the question of design. Very little has ever been published along this line and generally the amateur, even if he understands the drawing of lines, does not know how to begin a design.

If the reader has followed my instructions in Part I, he has already fixed on his type, determined his dimensions and drawn a few sketches of his interior layout and an outboard profile, etc.

The first step to take in the design itself is to draw an outboard profile to a one-half inch scale as close as possible to the actual boat (Fig. 13), showing the sheer freeboard, etc., so that the eye can size it all up at a glance. We cannot determine this drawing exactly yet, but it should be ready so that we can transfer points back and forth from the larger profile. With this drawing mapped out we are ready to tackle the lines.

Some designers determine what displacement they want before starting out and design the boat so as to get this displacement. This complicates the work of the design and confuses the beginner. Later on I shall show how this can be done, but at this time I think it would be a waste of time. The average boatman does not care what his displacement is and even if the boat should not come to her designed waterline it would make but little difference. If we fixed on a given displacement it would mean that we should have to make a calculation of all the weights going into the boat before starting out, and this would be impossible with our present knowledge.



A design in an early stage of development, showing how the sections originally drawn in free hand must be changed in the process of "fairing up."

For simplicity, brevity and the non-technical way in which the subject is presented, Mr. Chapman's articles on motor boat designing are the best that have appeared. In this, the second of four installments, the drawing of the lines and sections is considered and whether you are actually interested in designing or not, the subject is presented so simply that you cannot afford to miss it—it will give you a better understanding of designs and the ability to judge a boat before it is actually built.—Editor.

Some designers also talk about trochoidal curves of areas, inverse sines, curves and the like. While the curve of sectional areas has a great influence on the boat's performance, this talk of trochoids, etc., is of no practical value. Such things as prismatic coefficients, midship coef., etc., are of interest to the professional designer, but they only confuse and trouble the amateur, so let us forget all this and turn our attention to the design. Some of these points will be touched on in a later article, especially the effect of the curve of areas.

As I said in my first article I am going to show the reader the principles of design by an actual example, but the same method applies to any type the reader may choose. Having gotten our materials together and the paper fastened down we are ready to begin:

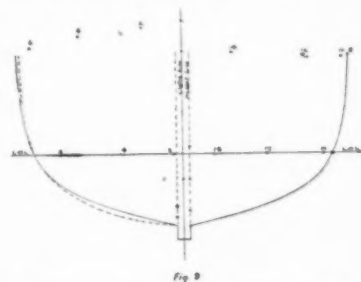
STARTING THE DESIGN.

First of all map out where the various plans are going. The arrangement of the lines, as shown in part one, is a good layout, although most designers place the body plan on the middle station of the profile plan. This procedure, although the best, had better not be attempted by the beginner. Now strike in a straight line for the L.W.L. in the profile or sheer plan (Fig. 8). On this lay off the L.W.L. length and the overhang forward and aft. Transfer the points of sheer (freeboard) from the smaller layout (Fig. 13) and sketch in contours of stem and stern as determined from Fig. 13. These are things one must study by himself and one must bring his own experience and artistic taste into practice. The

amount of sheer and freeboard forward and aft must be determined from his own experience and comparison with existing boats. There can be no rules or formulæ given for these. It should be remembered that while the outline has been sketched in to satisfy the eye in (Fig. 13), that (Fig. 8) is the plan from which the boat must be built and here the outline is much larger and must be fair. The lines may and will be changed more or less, but the general idea of Fig. 13 should be kept, or the new lines reduced to Fig. 13, for Fig. 8 is too large for the eye to size up.

The sheer line has a lot to do in determining the looks of the boat and considerable care should be given to this. The lowest point should be about two-thirds the distance aft. It may be necessary to redraw this line several times before a satisfactory one is obtained, but the general effect should already be shown in Fig. 13.

Having laid out roughly the general shape of the bow and stern, and laid off the heights of sheer line, as determined in Fig. 13, take the spline and weights (Fig. 5) and bend the spline to approximately the curve desired. Now stand off and look along this curve (the weights should always be on the inside of the curve) and see if it is fair and sweet. Keep changing this line and study it from various positions until you think you have a satisfactory curve, then draw it in with a pencil. Suppose on looking along the batten it seemed a little flat in the neighborhood of "X." Lift up the weight at this point and let the curve spring to its natural shape, then replace



it and lift the next one. This method will be found useful later on when certain points must be held in fairing, although in using it the weights should be close together.

LOCATING THE L.W.L.

The location of the L.W.L. is really the most difficult task for the amateur. How are we to know that the boat will float at any particular line we may choose to draw? The weight of the hull, fittings, etc., must equal the weight of the water displaced (1 cu. ft. = 64 lbs.). Therefore the volume of the hull below the L. W. L. must equal the weights making up the boat. Sometimes (always in large boats) the designer makes some preliminary calculations of the weights of his boat and then designs her so that the displacement equals this weight. Quite often a motor boat designer can hit the water line very closely by guessing from his past experience; in fact, this is the way it is generally done.

We cannot take all these points up at once, and as yet we have not learned how to figure displacement, so for the present the reader must determine the displacement (in this case the draft and size of the underbody) by his own judgment and from data he has collected.

Now let us lay down the draft forward and aft, which we already have determined (Part I) and draw in the keel line.

The next line to determine is the rabbet line shown in Fig. 8, dotted. This is the line at which the planking joins or rabbets into the keel. It really is the bottom line of the hull. (Study Fig. 2 and see how the various sections fair into the keel.) Forward and aft on the stem and stern this line is determined more or less by the shape of the boat, but it should be drawn in at this time, however. We will determine the depth of the keel forward, say 4 in., and measure up this distance. Now the rabbet line fair into the contour of the stern as in Fig. 8, so already we have this point. We must take care to give the rabbet line a good clear run aft, as in Fig. 8, for this is the line the water follows as it goes under the boat, and we must have a good clear run for the water. In some types, especially the racing type, the rabbet disappears more or less and is of little importance.

Having finished the sheer plan, we should divide it up into a number of parts or stations. Some designers space the stations at some even number of feet apart, starting at the midship section, others place one at each end of the waterline and divide the space between into a number of equal parts with a station or two at the ends generally placed closer together. The latter method facilitates the work of calculation later on, but the former is the most straightforward.

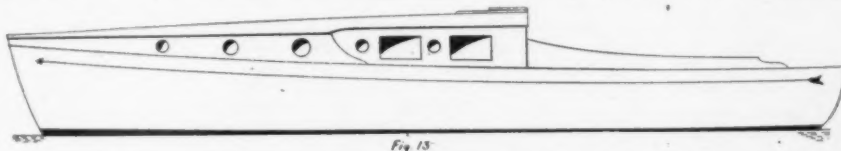
THE MIDSHIP SECTION.

We are now ready to sketch in the midship section (Fig. 9). This should be located just a little aft of the mid point of the L.W.L. We have two points on this section already, the sheer line point and the draft to the rabbet (neglect the keel for the present). We already have determined our L.W.L. beam and our maximum beam, so this gives us three points for our section—the rest is up to us. The best and quickest way is to sketch in free-hand some line we think about right, suppose the dotted line shown in Fig. 9. Now this line gives too flat a section and would make a bad sea boat, besides this it is rather full and would mean too much displacement. It is well to give any boat a pretty good dead-rise and a rather easy bilge. After several attempts and considerable thought the curve shown was determined on; this we shall stick to as final. It is a good plan both here and elsewhere to remember that the boat has to be built and make the lines so the building will not be too complicated. We should now determine the

keel width and draw in lines representing the half-width of keel shown as "rabbet line" (Fig. 9—see also Fig. 2).

DRAWING THE L.W.L.

The next step after the midship section is finished is to draw the outline of the load waterline (Fig. 12). At this point the designer should have it well in mind where his greatest



The preliminary profile is the keynote of the design, although it is seldom possible to follow it exactly.

weight (in this case the engine) is coming and make the center of the underbody near this point. Obviously we would not place the engine well forward and have the boat fine forward and full aft. We shall consider this at length, however, under the head of "Trim." We have three points for the L.W.L. curve, bow and stern (projected from Fig. 8 to Fig. 12) and one-half beam at the midship section (M.S.) transferred from Fig. 9. We shall now spring in a curve for the L.W.L., with the spline and weights, as we did for the sheer line. As before, the shape of this line depends on the designer's experience, and the type at hand, but a few suggestions will not be out of place here. First of all do not make the line "hollow" forward; that is, with a concave curve. Let a straight line be the finest ever used and generally it should be fuller except in high speed boats. A hollow line has been shown by model tests to give more resistance than a full line, contrary to popular belief. Aft the line should be full—even fuller than you expect—so that there is no tendency to drag water.

Of course the shape varies with different types, but keep these points in mind and also consider how the water would flow around the line and you cannot go far astray. If you are uncertain as to the best line here or elsewhere draw in something and get a start and the changes will come easily and many suggestions will follow quickly. Be sure when you finish to have a sweet, fair curve. Squint along the batten from both ends and lift weights here and there where it seems unfair, but get the



Fig. 15

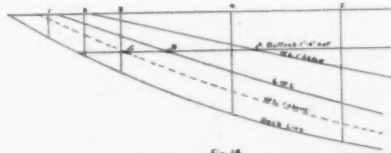


Fig. 16

The intersections (A, B and C) of the waterlines and one of the buttocks, in plan and elevation.

curve you want; don't let the batten take any curve it happens to. As the design advances, it may be necessary to change this line slightly, but generally not at all. It is well to spend considerable thought and time in drawing the L.W.L. for it is the most vital line in the design.

THE SHEER LINE.

The deck or sheer line (Fig. 12) should now be drawn in. This is comparatively easy, as we have the L.W.L. to guide us. It should

generally be somewhat fuller than the L.W.L. forward and aft, unless, as in a racing boat, it has a tumble home aft. In this design the dotted line "A" was drawn first, but later on, when the sections were drawn, the line "A" gave poor sections forward (2, 4, 6, shown dotted) and it was filled out to the solid line. So draw in something at this time and it can be changed later if the sections seem to require it.

We now have a profile, amidship section, a load waterline and a preliminary deck line "A," so the outline and determining features of our design are finished. Now take a piece of paper and transfer the half-breadths of the load waterline from the various stations (Fig. 12) to the L.W.L. on the body plan (Fig. 9). For the first part of the work it is best to use only alternate stations 2, 4, 6, 8, 10 and 12 (Figs. 8 and 12). Later on when these are faired the others can be readily drawn with very little trouble or fairing.

The lowest point of these stations (rabbet line Fig. 8) should be transferred to the rabbet line (Fig. 9). Also transfer the one-half widths of the deck, and see that each point is laid off at its proper height (shown in Fig. 8), as well as its proper one-half width (shown in Fig. 12).

This gives us three points for these stations, as shown in Fig. 9, through which we can sketch in some sections. Just what shape and form these sections should have is a matter of personal experience and judgment. The reader will now have a chance to see what he can do and all his past study and experience with boats should be brought into play. However, as there are three points for each section, the designer cannot go far astray at this point, for the two principle lines L.W.L. and rabbet have been already fixed.

THE SECTIONS.

We will now sketch in some sections free-hand. Do not draw them with curves. Fig. 11 represents the first attempt. Probably the beginner will sketch in anything but sections that have any connection or fairness with one another at the first attempt. Fig. 11 is characteristic of a beginner—the dotted part of the section drawn to the dotted deck line "A." The beginner should learn at the outset to study these sections and see if they really are similar to one another, and bear any resemblance. Note Fig. 2 (Part I) how stations 8, 9, 10 and 11 resemble one another. Also notice stations 4, 5 and 6. While these are quite different from one another there seems to be something common to them that pleases the eye. So also with stations 12, 13 and 14.

Now turn to Fig. 11. Do these sections appear as if they had some connection with one another? If one station tends to fill out at one place do the adjoining stations do the same? Does one station have a flat place in it that doesn't seem to be in the next? What about stations 8 and 10; do they look as if they were similar?

Go over your sections and fair them up by your eye a little; make each curve a smooth, fair curve by itself; fair out the flat places and the sharp bumps as "R" (Fig. 11). Don't be afraid to use the eraser. Use a fairly soft pencil and keep after them until they are the best you can make them. Be sure, however, to hold the three points and don't miss some of them, as in Fig. 11. At this place it was seen the stations 2, 4 and 6, shown dotted in Fig. 11, had too little flare, so a new deck line (Fig. 12) was drawn and the sections changed to conform to it.

Of course, as we are thus far using only alternate stations, this method of comparing one station to another is more difficult, but the practice gained here will help greatly when the other stations are drawn in later on. Only practice, however, can make one perfect in this respect.

To go back to the body plan again: However unfair the body plan may be we know that there are three points on each station that are fair with one another, for the lines connecting them are fair curves (rabbet line, Fig. 8; sheer and L.W.L., Fig. 12). We will now proceed to draw in a diagonal. I am assuming that the reader has already made himself familiar with these various lines, so I shall proceed accordingly.

DIAGONALS.

Diagonal No. 3 should now be drawn across the body plan (Fig. 11), and by means of a piece of paper the intercepts of the stations marked off and transferred to their proper stations (Fig. 10. Note the points clearly shown in Fig. 10).

We will now attempt to draw a fair line through this with our batten and weights. It is seen at once that this is impossible, which means that our boat is unfair along this diagonal. We must hold station 8, as that being the midship section (M.S.) it is fixed. Some points seem too far out, others too far in, so let us strike a happy medium, and draw a line as shown, with some points outside and some in.

With a piece of paper, as before, we should mark off the intercepts of this diagonal on the various stations in Fig. 10 and transfer them back to body plan, and change the sections so that they pass through these points. If it seems impossible to pass a certain section through this new point and still hold the original three we must go back to Fig. 10 and change the diagonal, so that we can get a fair diagonal and fair sections. Several other lines than the one shown (Fig. 10) could have been drawn through these points and the designer must spring a batten through, and then look back at the sections and see which points are best to hold, which to go inside of and which to go outside of.

We now have four points on our sections that we know are fair (sheer line, rabbet line, L.W.L. and Diag. No. 3). Another Diag. No. 2 can now be drawn, following the same procedure as for No. 3. We have four points that we must hold, or at least we should try to hold points on Diag. No. 3, if possible. As before, we may have to change our original Diag. No. 2 (as drawn in Fig. 10) to give a fair section, and Diag. No. 3 may have to be changed somewhat also (Diag. No. 2 is omitted in Fig. 10 to avoid confusion). The new diagonal may be so out of harmony with the old one in Fig. 10 that one or both of them may have to be redrawn. The same points that I mentioned about the similarity of sections holds for all the other curves as well. For a design to be a good one, the diagonals, as well as the water lines and buttocks, should bear some relation to one another (note design shown in Part I). Here each diagonal and water line seems to have some connection with the others and are not a lot of unconnected fair lines, as some of the designs published are. It is a good plan to study designs by noted

naval architects, and notice how these various lines resemble one another, and try to incorporate the same idea into your design. I say, noted naval architects, for one must be careful whom he takes for his authority in these days, when office boys and draughtsmen call themselves naval architects.

WATER LINES.

Diagonals are much better for fairing than water lines, as they cross the sections at almost right angles, and give a clearer intersection. Diagonals I fear do not mean much to the amateur, nor tell him much about his boat. Later on, however, after a little practice, he will understand them better. So before going further let us draw a water line, say 1'-0" below the L.W.L. (see design Part I). This will give the beginner some idea of what his underbody looks like. Draw in the water line on the body plan and transfer the points as before to plan 12, and spring in a curve with the batten as near as possible through the points, studying the body plan as before to see which points may be moved in and which points moved out. It will be necessary to hold some point very closely; for instance, Fig. 2, Part 1. Station 7 on W.L. 1'-0" below. This point is very close to the point on Diag. No. 3, which has already been faired, and any change in this point on the water line would throw out Diag. No. 3, and upset the whole design more or less. However, it may have to be changed to give a good water line, but this is part of the beginner's trouble. It may be necessary to change both diagonals to get a satisfactory water line.

The beginner should not feel discouraged if he has to keep changing one line and another, and at times the situation seems to grow worse instead of better. All this must be expected at first, especially in the first attempt at designing, but careful study and close attention to the points I have mentioned will soon bring success.

Perhaps at this point, when the second water line is fair, it will be best to draw in the new stations 1, 3, 5, 7, 9, 11 and 13. First transfer the points from the several faired lines to the body plan (Fig. 11) and then sketch in the sections. If the lines have been properly faired these new stations should give little if any trouble. Notice their relation with the original stations and see if they are in agreement and seem pleasing to the eye.

Another diagonal (No. 1, Part I) can now be drawn in across Fig. 11 and the points transferred to Fig. 10, as before, and a fair line should be drawn through them if possible. Try to make these three diagonals in Fig. 10 look somewhat alike. Study them with their relation to the stations and see if they are the best you can do. It should be mentioned at this point that the ends of the diagonals are very unreliable, especially where they turn in sharply, and it is a good plan to end them at stations 1 and 14, and not try to draw them into the center line if there is a sharp turn at the end.

BUTTOCK LINES.

At this point a buttock line (see design Part I) should be drawn in. Draw a line across the body plan (Fig. 11) one foot out from the center line and on a piece of paper mark off the intercepts of the stations on this line above and below the L.W.L. (see Fig. 2). We now have the heights of each station above and below the L.W.L. at a distance one foot from the center. With the piece of paper mark off these heights on the proper station in Fig. 8. You should be able to pass a fair line through these points if your boat is fair (buttock 1'-0" out Fig. 1). The line should resemble the rabbet line (Fig. 8) somewhat. Probably when you try to spring a batten through these points, it will not be fair, especially near the ends. Before going further this buttock line should be drawn across the water line plan (see design Part I). This cuts the two water lines and these points of intersection with the water lines in Fig. 12 should be projected down to the proper water line in Fig. 8. For instance, point "A," Fig. 14, is point "A," Fig. 15, and point "B," Fig. 14, is point "B," Fig. 15. The heights "x" and "y," Fig. 15 are the heights transferred from the body plan, as mentioned above. So far we have but two water lines, but when more are drawn, in as 1 above, point "C" (Fig. 14-15) should be looked after.

The reader may find a good deal of trouble with his first design at this point, especially forward and aft, but if he studies the sections and the other lines and sees where he can make the change to the best advantage he will soon straighten things out. After this buttock is in and fair his troubles are over. Water lines 1 and 2 above can be drawn in now and will give practically no trouble, except perhaps the changing of the upper part of a station here and there. This, however, will not affect any of the other lines, and only fairs the upper part of the boat. Another buttock (2 feet out) and diagonal No. 4 can be drawn in and the work is finished.

The beginner no doubt will have many discouraging moments in his first attempt, but if he keeps all the various lines before him at once, and doesn't make a change in one line before he ascertains what other lines and points are affected, he will soon master the art and find it extremely fascinating and interesting. Try to spend enough time at the outset on the contours of bow and stern, the rabbet, the midship section and the L.W.L., and stick to these throughout the design. The rabbet line, midship section, and load water line really determines the whole design, and the other work is mostly secondary.

Next month we shall take up the study of the curve of areas or displacement curve and see how the whole performance of the boat depends upon the shape of this curve.

It should be remembered that this design was made for illustrative purposes and is not one to be copied or held up as an example.



A good example of the double cabin cruiser, a type that is growing in popularity—A 31-footer designed and built by G. R. Richardson, of North Tonawanda, N. Y.

British Gasoline-Kerosene Engines

By J. Rendell Wilson.

No. 4--The Ailsa Craig.

SHIPBUILDING on the River Thames has —alas!—considerably declined during recent years, and one by one the great firms have migrated to the North and South of England where land, living and labor are cheaper. Yarrow's have gone to the Clyde, Thornycrofts to Southampton, and others elsewhere. But with the vanishing of Thames shipbuilding, the motor boat industry has sprung up Phoenix-like from the ashes, and at the present time is one of the most thriving industries of the riverside.

Among the oil engine firms that have been established on the banks of the Thames for some years, is the Ailsa Craig Motor Co., Ltd., of Stroud-on-the-Green, Chiswick, W., whose title obviously owes its origin to the famous rock of that name; in fact, the Ailsa Craig rock was for many years used as a trade-mark by this concern. The company, in addition to constructing marine motors, have lately taken up boat building. They are indirectly connected with America, inasmuch they are the British representatives of the Michigan Wheel Company, whose propellers are becoming very popular across the Atlantic.

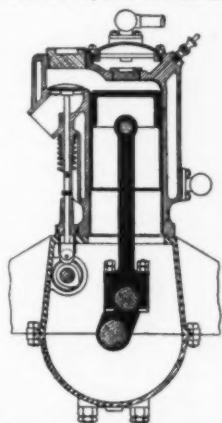
Although the firm turns out a large range of engines up to 100 h.p., I propose to deal only with the S/4 type, which is of the 4-cycle class, working on either gasoline or kerosene. This engine has four cylinders, 5-inch bore by 5½-inch stroke, and develops 39.5 b.h.p. on both fuels at 950 revolutions per minute, although the normal running speed is between that figure and 700 r.p.m., so that the power generated under ordinary working conditions is slightly less.

As the engine is specially designed to run on two grades of oil a cylinder compression of 70 lbs. per square inch has been adopted, while the valves have a diameter of 2¼ inches, and the valve opening 2 inches diameter. In gen-

This is the fourth of Mr. Wilson's series of articles on those British motors using either kerosene or gasoline as fuel, and which includes practically all the prominent ones made in England. As a comparison with our own designs these are not only very interesting but often instructive as the problem they are solving will soon be an important one on this side of the Atlantic.—Editor.

longer period in which to make their exit along the exhaust pipe.

All valves have been arranged on the starboard side, and the exhaust branch is enclosed



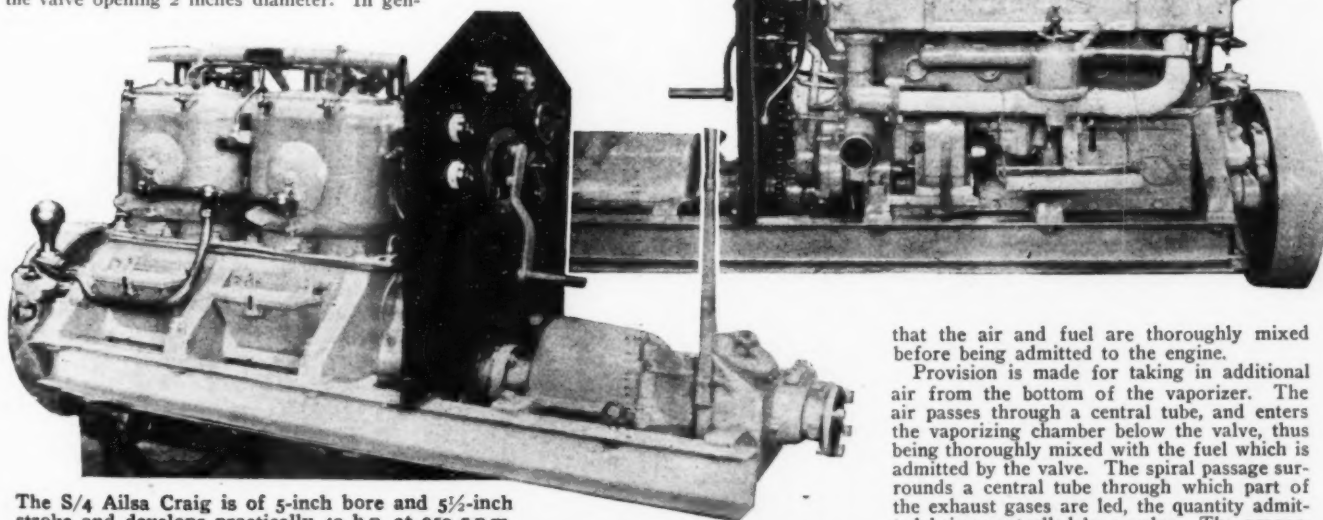
Section showing the offset crank shaft to eliminate side thrust.

in a water-cooled cast-iron box, under which are the carbureter and induction pipes. Beneath the carbureter a tray is provided for catching any drips of gasoline and preventing them from flowing to the bilge. On this side is also the high-tension magneto, the distributor of which is self-contained, while the leads are

side of the case. This rod is connected to a butterfly valve in the induction pipe, quite independent of the carbureter throttle. If necessary the governor can be adjusted to cut-out at any desired engine speed.

The inlet and exhaust valves are each made in two sections. They are, of course, of the mushroom type, and the head is made hot and is screwed and shrunk on a tapered stem, and additionally secured by a small pin screwed into the joint. This system enables the valve head to be made of cast-iron, and the stem of mild steel, and is intended to eliminate "grinding in." Each piston is turned and then ground slightly taper, to allow for the expansion caused by the heat of combustion. Four eccentrically turned step-jointed rings are fitted to all pistons.

Brief details of the exhaust heated kerosene vaporizer will perhaps be interesting. It consists of a spring-loaded lift valve, which is opened by the suction of the engine. The valve has a broad face, to the center of which the fuel supply is brought, so that when the valve is closed both fuel and air are simultaneously shut off. Upon the valve being opened by the suction of the engine, the fuel is drawn in through a small jet in the face of the valve seat in the form of a fine spray. At the same time air is also drawn in through the apertures above the valve seat. The mixture enters the chamber below the seat, and takes a spiral course through the body of the vaporizer. The spiral in the interior serves to atomize the fuel as it impinges upon it, so



The S/4 Ailsa Craig is of 5-inch bore and 5½-inch stroke and develops practically 40 h.p. at 950 r.p.m. This is another instance of the unit construction with controls centralized on a "dash."

eral design the engine is very neat, all valve gear being entirely enclosed for silent running. It is interesting to note that this is one of the very few British engines in which the "off-set" crankshaft principle has been adopted. In view of the elimination of side-thrust thus obtained the design is to be commended. To those who are not conversant with the practice the diagrams will explain this clearly. By offsetting the center of the cylinder in advance of the center of the crankshaft the connecting rod is practically parallel with the sides of the cylinder as the explosion takes place, thus the piston gives a direct downward thrust without any side-thrust on the walls of the cylinder. Another advantage is that toward the end of the piston stroke the piston speed is reduced while the crank is turning over the dead-center, so that the exhaust gases have a slightly

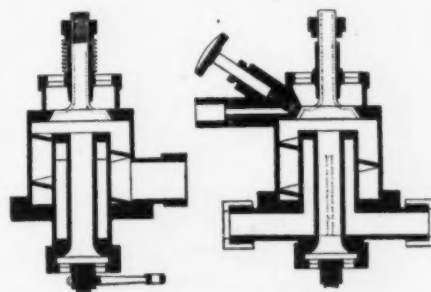
carried to a fiber-insulating tube on the cylinder heads, thence to the plugs. The latter are fitted with vulcanite and brass covers, forming protection from moisture or seawater. The magneto is driven by enclosed gearing off the half-time shaft, which is also enclosed.

On the starboard side of the crank chamber there are two large inspection doors, while on the portside there are two specially designed traps fitted to the doors through which lubrication oil can be poured when necessary. Between the flywheel and the forward end of the crankcase is mounted the cooling water pump, which being of the plunger type is operated by an eccentric on the camshaft.

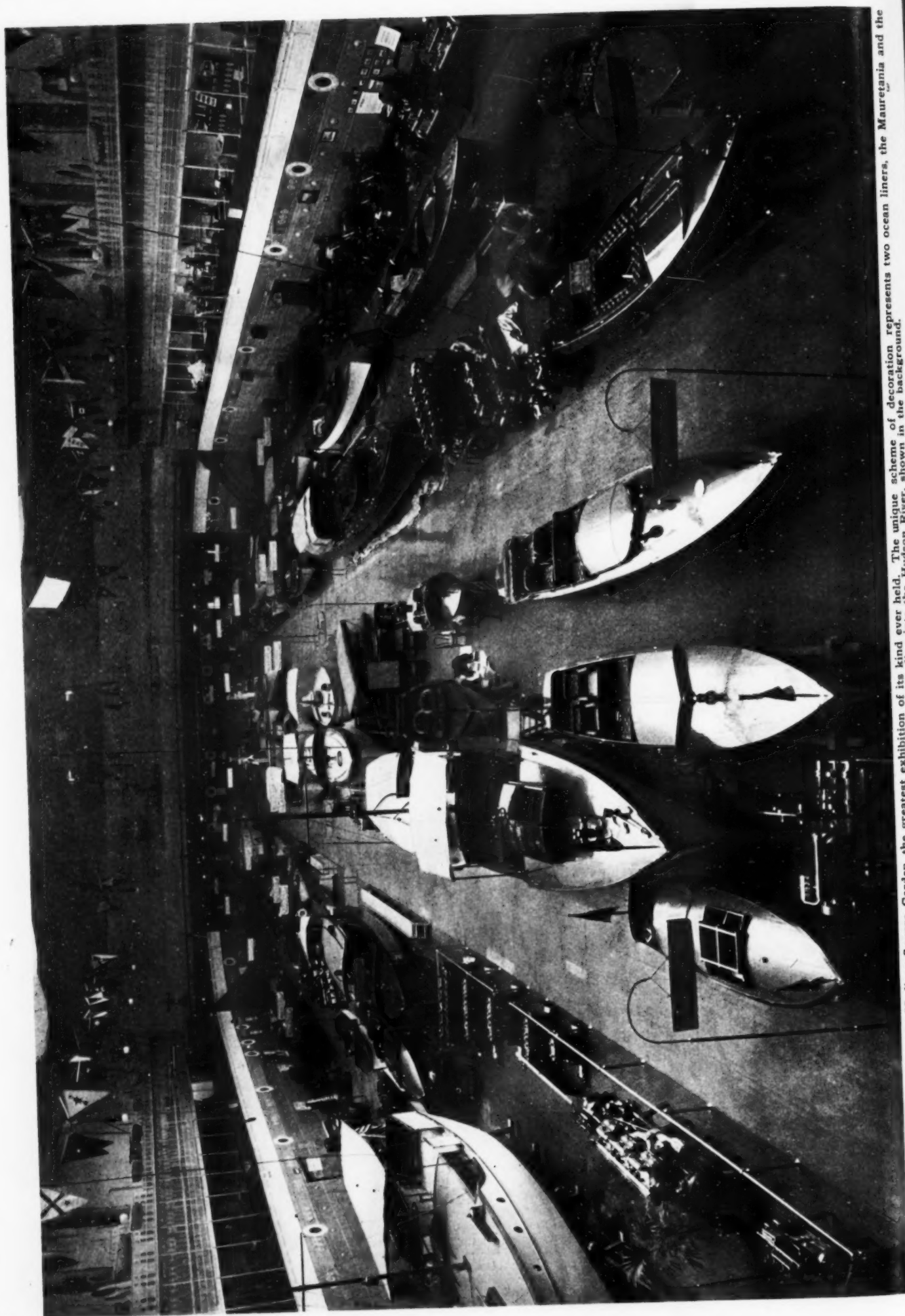
A governor has been fitted, and is of the centrifugal type. The governor balls, which are spring controlled, operate a sliding collar, that moves a fork actuating a rod on the out-

that the air and fuel are thoroughly mixed before being admitted to the engine.

Provision is made for taking in additional air from the bottom of the vaporizer. The air passes through a central tube, and enters the vaporizing chamber below the valve, thus being thoroughly mixed with the fuel which is admitted by the valve. The spiral passage surrounds a central tube through which part of the exhaust gases are led, the quantity admitted being controlled by a valve. The proportion of fuel and air is automatically regulated according to the speed of the engine.



Sections of the Ailsa Craig gasoline vaporizer. The mixture is taken through a spiral passage surrounding a chamber through which part of the exhaust gases are led.



A general view of the Motor Boat Show at Madison Square Garden, the greatest exhibition of its kind ever held. The unique scheme of decoration represents two ocean liners, the Mauretania and the Olympic, moored at either side of a dock extending into the Hudson River, shown in the background.

THE NEW YORK SHOW

The New York Motor Boat Show.

The Annual Exhibition of the National Association of Boat and Engine Manufacturers.

Descriptions of the Exhibits that Were to Be Seen at Madison Square Garden.

The Reliance Motor Boat Co., which has its works at 210th St., on the Harlem River, and its office at 17 Battery Place, New York City, occupied spaces N and O where five fully equipped motor boats were on exhibition. The first of these was a magnificent mahogany day cruiser 40 ft. x 7 ft. 9 in., powered with two 5 x 5 in., four-cylinder Continental motors, developing together 100 h.p. and driving twin screws, which give the boat a speed of about 22 miles per hour. The boat has a glass-sided cabin, luxuriously furnished, with chairs and center-table and two transom berths. A small lavatory and toilet room occupy one corner of the cabin on the starboard side. The boat has a large cockpit and is electric-lighted with a dome light in the cabin and searchlight. With the 40 footer was shown the famous runabout and racer Peter Pan IV, and a beautiful 23-foot runabout, equipped with a model J 40-50 h.p., four-cylinder Continental motor. A 21-foot speed runabout was shown with an auto steering wheel on which the spark and gas controls were mounted, driven by a four-cylinder, four-cycle 3 3/4 x 4 in. Reliance motor with Bosch dual magneto and battery ignition. The feature of the display, however, was a special 18-foot mahogany yacht tender, built for J. Stuart Blackton, commodore of the Atlantic Yacht Club and rear-commodore of the Motor Boat Club of America, and intended for his flagship, the Paula. This little craft has a capacity of ten persons. The unique and special design of the boat attracted much attention from show visitors. The company also showed a six-cylinder 6 1/2 x 7 in., high-speed Reliance engine, developing 150 h.p. with each set of three cylinders cast en bloc and a four-cylinder Reliance Continental marine motor, 4 1/4 x 4 1/2 in., fitted with clutch and reverse gear, ready for installation and equipped with the special Reliance rear starting device.

The Gas Engine & Power Co. and Chas. L. Seabury & Co., Cons., Morris Heights, New York, occupied a large section of the main floor. Here was seen a 53-foot twin-screw day cruiser type launch, with mahogany planking and finish, and equipped with two six-cylinder, 6 x 6 in., aluminum base Speedway engines, which are guaranteed to drive her at a speed of from 23 to 24 miles an hour. This boat has a small cabin forward with the engine compartment next aft and is arranged for one-man control. She is owned by Mr. John C. King, of the New York Yacht Club, and will be used in Maine waters. In addition to the 53-footer, a 30-foot runabout was displayed, one of the regulation stock type, cedar planked, mahogany finished and equipped with a four-cylinder, four-cycle 4 1/2 x 5 in. Speedway engine, which sends her along at a rate of 15 miles an hour. A handsome yacht tender was another representative of the 30-foot class. She is planked and finished in mahogany, powered with a four-cylinder 4 1/2 x 5 in. Speedway engine and is destined for the steam yacht Kanawha, owned by Mr. A. Baudouine. A 21-foot stock tender with a 4 x 4 1/2 in. Speedway engine furnished a specimen of the smaller class. These boats are capable of a speed of from 16 to 17 miles per hour. The company's line of marine engines was represented by a six-cylinder 8 x 8 in. machine with



The Famous Reliance Speed Boat Peter Pan IV.

an aluminum base, developing 200 h.p., also a six-cylinder 11 x 12 in. Speedway motor, developing 250 to 300 h.p., equipped with an air starter and reverser. A four-cylinder 4 x 4 1/2 in. engine with an aluminum base brought up the end of the string. This is the style used principally for yacht tender service. An interesting part of the exhibit was a Speedway gasoline combination generating set. This comprised an engine with three 4 1/2 x 5 in. cylinders, mounted on a cast iron closed frame which is bolted to a bed with the base extended for a three k.w. generator, with a capacity of 54 sixteen-candlepower lamps. The two end cylinders are fire cylinders while the center one is an air compressor.

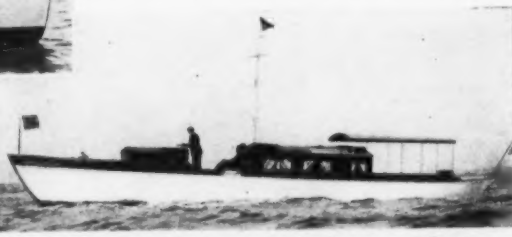
The W. H. Mullins Co., of Salem, O., had their exhibit in Blocks Q and P. There was seen a 26 foot steel auto boat, equipped with a Loew-Victor 30 horse-power, 4-cycle, 4-cylinder engine with two separate and distinct sets of ignition, namely a Connecticut ig-

niter and Bosch magneto, air compressor, reverse gear, rear starter and Mullins patented silent underwater exhaust. The boat was furnished with steel automobile seats luxuriously upholstered and had an automobile steering wheel with spark and throttle levers, Kenyon automobile folding tops with storm and side curtains and wicker chairs. The hull was handsomely finished in mahogany and had brass trimmings and fastenings throughout. There was also a 20-foot auto boat of the same general type except that it was finished in oak and maple and was equipped with a Ferro 2-cylinder, 8 horse-power engine, with the Ferro automatic pressure oiling system. The Mullins "Leader" launch was shown in a 26-foot size, powered with a Ferro 11 horse-power, 2-cylinder engine and an 18-foot size driven by a Ferro 6 horse-power, 2-cylinder engine. These launches had the engines housed under a specially designed hood, eliminating any possibility of the passengers coming in contact with the machinery. In addition, there was a 16-foot launch equipped with a 3 horse-power Ferro motor. The Yale and Harvard 16 and 18 foot canoes were included in the display, each equipped with buoyancy pads to prevent sinking and built with open gunwale construction, keels and specially designed brass plates to protect the bows. A full line of pressed steel row boats equipped with air tight compartments could also be seen.

Rice Brothers Company, East Boothbay, Maine, had a specimen of their 20-foot fast runabout in space D. This boat has 4 1/2 feet beam and is equipped with an 8-10 h.p. Rice double-cylinder, jump-spark motor, driving the boat about 12 miles an hour at 900 r.p.m., and a No. 20 reverse gear. In addition to the runabout, the company makes a 20-foot launch with the same beam, driven by a 4 h.p. Rice single-cylinder, jump-spark motor at a speed of 8 miles an hour when the engine is running 750 r.p.m. This model is the company's specialty, and by turning it out in large quantities at low cost they are able to put it on the market at \$275.00.

The Electric Launch Co., Bayonne, N. J., makers of "Elco" motor boats, had their exhibit in the center of the Garden at the entrance to the arena. Here a 1912 Elco de luxe motor yacht attracted the attention of the visitor. This boat is similar in design to the one exhibited last year, but with certain changes in detail of equipment and construction. The boat has a cabin enclosure amidships, large open cockpits, fore and aft, and can be controlled by one man. Her dimensions are 54 feet by 9 feet, and she is powered with a 60 h.p., six-cylinder, air-starting, Standard gasoline engine. A 100-gallon gasoline tank gives a cruising radius of over 200 miles. The boat has a guaranteed speed of 15 miles an hour and sells for \$10,500. A 40-foot raised deck 1912 Elco cruiser was exhibited in the space of the Standard Motor Construction Co., of Jersey City, N. J. The boat accommodates seven comfortably, this capacity being due in a measure to the excellent head room provided in the cabin permitting the use of two upper berths. There are two excellent built-in berths in the forward quarters and four more can be made up in the main saloon with still an-

40-Foot Elco Cruiser.



35-Foot Elco Express Launch and 54-Foot Elco De Luxe Motor Yacht. The speed boat in the center is the famous 16-foot Elcoplane Bug.

THE NEW YORK SHOW

other in the motor room. A unique feature of the Elco cruiser is the flush after deck, instead of the ordinary cockpit, giving nearly 40% increase in the deck space. The boat is steered and the engine controlled on the main deck. The power equipment is a 16-20 h.p., four-cylinder Standard engine and the boat sells complete for \$4,500. A 35-foot Elco express launch was also exhibited at the show with a beam of 5 ft. 3 in., and the hull finished in selected mahogany. This boat differs from last year's model in having a greater flare at the bow, higher freeboard and larger cockpit area. The power is supplied by a 60 h.p., six-cylinder Elco engine and the boat is arranged for one-man control. This handsome craft sells for \$4,000 with a guaranteed speed of 24 miles an hour. A smaller express model was shown in the 28-footer, with a beam of 5 feet, equipped with a 40 h.p. Elco, giving a speed of 20 miles an hour. This boat sells for \$1,950 and has proved a very popular model. Perhaps the most interesting boats in the Elco exhibit, however, were the Elco-planes, among them the famous little Bug, which made such a record for herself last season. This boat won the Interstate trophy for motor boats under 33 feet at the motor boat carnival at Huntington, L. I., and the New York-Poughkeepsie Race, a distance of 132 miles, besides capturing the \$5,000 Gould prize by defeating the 185-foot steam yacht Helenita in a race from Huntington to New London, Conn. The Bug weighs 2,400 lbs., which is 40 lbs. to the horsepower. The cups won by the Bug and the Edith II, which also belongs to Mr. Albert E. Smith, were on exhibition with the boats. The 20-foot Elco-planes, with a guaranteed speed of 30 miles per hour, is referred to elsewhere in this issue. Elco-planes sell for \$3,000 in 16-foot lengths with a guaranteed speed of 30 miles or \$4,000 in 20-foot lengths. A 25-foot Elco electric launch of the latest design also formed part of the company's exhibit.

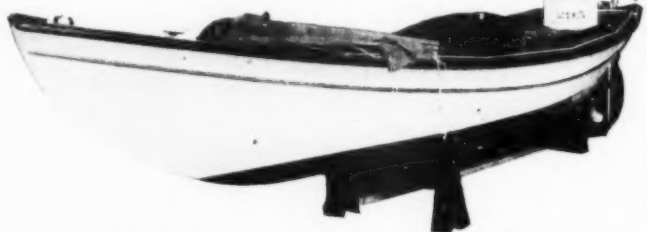
The Elco line of gasoline marine engines exhibited at the show consisted of a six-cylinder 60 h.p. motor with gun-metal finish, equipped with clutch and reverse gear and Bosch magneto, and having a total weight of 765 lbs. With this was shown a four-cylinder 40 h.p. which is a duplicate of the 60 h.p., except that it has two cylinders less. In the Elco space was shown a 150 h.p. six-cylinder American Nurnberg heavy oil engine, built by the New London Ship & Engine Co., of Groton, Conn. This line of oil marine motors is fully described elsewhere in this issue.

The Geo. Lawley & Son Corporation, of Neponset, Boston, Mass., had a fine line of their motor boats on display. Among these was the 30 ft. runabout, "Magnet," with 5 ft. 6 in. beam and a draft of 2 ft. 3 in., equipped with a four-cylinder, four-cycle 18-25 h.p. Sterling engine, capable of driving her 14 miles an hour. The boat was cedar-planked with oak frames, copper-riveted and coamings, engine covers and interior trim were of mahogany. The starting crank, clutch, etc., were located in the helmsman's cockpit just aft of the motor and the controls on the steering wheel. In addition were exhibited two regular stock tenders. The corporation make these boats in three sizes—10 ft., 11 ft. and 12 ft. They are built of cedar with an oak keel and frames, have mahogany trimmings and are delivered to the purchaser complete with oars, rowlocks, etc. In connection with the Lamb Engine Company's exhibit, was the Lawley-built 37 ft. semi-speed cruiser "Iota." The "Iota" has a beam of 6 ft. 8 in., and a draft of 2 ft. 6 in. She is of the raised-deck type, both forward and aft, and is equipped with a six-cylinder 60-70 h.p. Lamb motor, which will drive her at a speed of 16 miles an hour. The engine room is located under the bridge deck and she can accommodate four people, two forward and two aft.

The Bayonne Launch Co., foot of E.

36th St., Bayonne, N. J., exhibited a 25-foot runabout in block D. This boat has the motor entirely concealed by a hood and separated from the cockpit by a paneled mahogany bulkhead, thus keeping the cockpit clean. The steering wheel and control is of the automobile pattern. The vessel has a beam of 5 feet, a canoe bow and curved transom stern. The engine is a 12-16 h.p. four-cylinder, four-cycle motor of the L head type, with a mechanical force feed oiler, splash lubrication in the base, float feed carburetor, jump-spark ignition from a k.w. high-tension magneto and bronze propeller. The gasoline tank is under the forward deck. The boat's equipment is very complete, including cushions for the locker seats, ensign, brass hardware and linoleum on the floor. Besides the runabout, the company builds a 33 ft. x 8 ft. raised deck cruiser and the same vessel in a 30 ft. length with similar interior arrangements but a shorter cockpit.

The Toppan Boat Mfg. Co., Boston, Mass., had their exhibit in space on the main floor. Here was displayed for the inspection of the visitor a 26 ft. raised-deck cruising launch, equipped with a 8-10 h.p. two-cylinder engine completely house in, with the flywheel in the cabin so that the engine could be started without going out into the weather. The boat was shown complete with linoleum on the floor, 4-inch corduroy cushions in the cabin and with its equipment very comprehensive in every respect. This boat is one of the company's new type with the V-transom and the after deck carried forward to form the seats in the after part of the cockpit, giving plenty of room. The cabin has accommodations for sleeping two and space for two



Toppan 18-footer; powered with a 3-4 h.p. motor.



Lawley 30-ft runabout "Magnet."

more can be provided by using a board between the seats. In addition to the cruiser, an 18 ft. oak-finished launch was shown, powered with a 3-4 h.p. Toppan engine. The launch was fitted with one of the red leather automobile tops which with the boat's brass fittings gave a fine appearance. The launch is not only for show, however, as it has many of the seagoing qualities of the dory, besides possessing the fine appearance of the more expensive runabout. The Toppan dory was represented by a 19 ft. smooth-planked craft, with oak decks, equipped with a 3-4 h.p. Toppan engine and also having one of the Toppan folding spray hoods. This type is one of the best sea boats on the market and has, besides, plenty of carrying capacity. A full line of Toppan engines was exhibited, including the following sizes: 2 h.p., 3 h.p., 5 h.p., 8 h.p. and 12 h.p. two-cylinder, selling at from \$56 to \$200.

The Valley Boat & Engine Co., Saginaw, Mich., had their exhibit in space T, where a representative line of their boats was on display. The feature of the exhibit was a 25 ft. 10 in. x 8 ft. 6 in. raised deck cruiser. This vessel is a real home on the water and is absolutely sea worthy in rough weather. By the use of two folding berths, she can sleep four and even more if necessary. She has an unusually complete equipment, including toilet,

folding lavatory, two-burner oil stove, lamps, fire extinguisher, etc. Equipped with a 10-12 h.p. two-cylinder Faultless motor, she sells for \$1,200, or if a 15-18 h.p. three-cylinder motor is desired, for \$1,300. With the smaller engine, she can make 8 to 9 miles an hour and with the larger engine, 10 to 11 miles. Besides the cruiser there was a 16 ft. x 4 ft. 6 in. runabout, which has proved to possess remarkable seagoing qualities for a craft of the runabout class. This boat sells for \$200 with a 3½-4 h.p. Faultless reversible motor, or at \$250 with a 5-6 h.p. motor. She has a speed of 9 or 11 miles an hour, according to the engine installed. The third of the trio was an 18 ft. x 4 ft. 8 in. runabout, presenting a very attractive appearance and showing the lines of a graceful and seaworthy craft. The location of the Valley Boat & Engine Co.'s plant, in the heart of the lumber district, makes it possible for the company to select the very best material for the construction of their boats and this, in conjunction with the most careful manufacturing methods, insures the production of a boat of unusual merit. The company besides completed boats, builds knock-down craft.

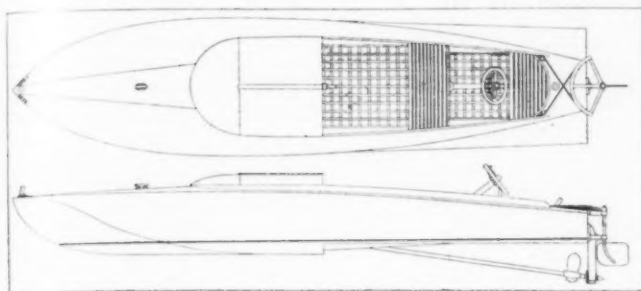
The Atlantic Co., Amesbury, Mass., had their exhibit on the main floor. The Atlantic Company's specialty is the "Gurnet" dory, built in 18½, 20½, 23½, 25½ and 30½-foot lengths. These are excellent sea boats and have large carrying capacity. A 16-foot "Gurnet" dory skiff and the 17-foot "Gurnet" launch are both new designs for 1912 and will be sure to interest all motor boatmen. Another popular design is the 25½ and 30½-foot semi-speed clipper. The 30½-footer has a flared bow this year, making for increased dryness and comfort. A handsome addition to the season's output of runabouts, is the Atlantic 28 by 4-foot 11-inch craft, with mahogany decks and bulkhead control, driven by a 20-30 h.p., four-cylinder, four-cycle Atlantic Chester motor. The Atlantic engine is one of the features of all boats built by this company. It is of the medium-duty type with extra large wearing parts and is built for hard constant service.

The Cleveland Auto Boat Manufacturing Co., Cleveland, O., had their exhibit in the arena. The company makes a fine line of launches in lengths of from 18 to 32 feet, as well as 40 and 60-foot gasoline tugs and cruisers. Besides the motor boats, row boats are manufactured in 14 and 16-foot sizes. The feature of the launch fleet is the 25-foot "Gentleman's Runabout," with a beam of 4 feet 6 inches, powered with a 2-cylinder, 2-cycle Ferro motor, developing 11 h.p. This handsome craft is finished in mahogany, is brass and copper-fastened throughout and makes an ideal boat for a fast spin after a hard business day. She has a high freeboard and flared bows, making her a dry boat, and her lines give her a tendency to raise forward when going at full speed. This boat is also built in a 32-foot size. Stock models are built in lengths of 18, 21½ and 24 feet and a 22-foot "Junior Runabout." All stock Auto Craft launches have air chambers under forward and after decks.

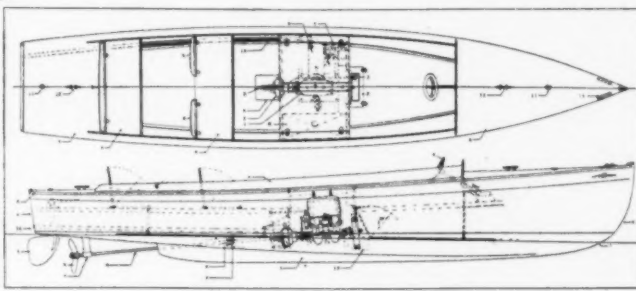
The Murray & Tregurtha Company, 340 West First Street, South Boston, Mass., had their display in Block B, main floor. The exhibit included a six-cylinder, open-base engine, developing about 70 h.p., which is the company's latest design and intended for semi-speed cruisers, and, in addition, a small electric light generator outfit. The Murray & Tregurtha Company manufacture various types of gasoline and steam launches and engines and the well-known Tregurtha water-tube boilers.

The Wolverine Motor Works, Inc., Bridgeport, Conn., exhibited their well-known line of Wolverine marine engines in Block O, main floor. Wolverine engines are made in 5 h.p., single cylinder, 12 h.p., double-cylinder, and from 18 to 100 h.p., three-cyl-

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17 1/2-foot hydroplane designed by S. S. and R. P. Breese.



Rice Brothers' 20-foot fast runabout.

under sizes in the heavy-duty, four-cycle type. This line of motors was represented by the 5-h.p., 18-h.p. and 50-h.p. sizes at the show, and with these was exhibited a new 5 1/2 x 7 two-cylinder engine, which is the 1912 addition to the Wolverine motor family. The 5-h.p. motor was shown with a Wolverine patented reversing propeller, which is the regular equipment furnished with this type, and the larger sizes with the regular spur gear reverse clutch. One of the features which attracted the attention of the observant visitor to these engines was the large bore and stroke as compared with the rated horsepower.

The Dean Manufacturing Company, Newport, Ky., exhibited their Fox marine and aero motors on the main floor. The exhibit comprised Fox Special engines in 3 1/2 h.p. single-cylinder and 7 h.p. double-cylinder sizes, Fox heavy-duty motors in 5-7 h.p. single-cylinder and 10-14, and 18-24 h.p. double-cylinder sizes; Fox medium-duty, two-cylinder engines in 8 and 14 h.p. sizes, and a 21 h.p. model with three cylinders, and three sizes of the De Luxe motors, namely, 24, 50 and 60 h.p. Both the medium-duty and the De Luxe type are equipped with the famous Fox fourth port. The four-cylinder 60 h.p. De Luxe is the latest addition to the Fox line, and is designed for the fastest types of racing hulls and hydroplanes. This engine weighs 200 lbs., and will stand continuous service at 1,400 r.p.m. The well-known speed boats, "June-bug," "Breeze I," the "Stearns," etc., were all equipped with the Fox De Luxe motors.

S. S. and R. P. Breese, 38 E. 23rd St., New York City, had space on the main floor where a full line of Fox de luxe, heavy-duty, medium-duty and high-speed motors were shown. Chief among these was the high-speed de luxe two-cycle motor with rotary valves. The engine had four cylinders developing 60 h.p. and weighed 200 lbs. These engines are made by the Dean Mfg. Co., Newport, Ky. In addition to the engines, a 17 1/2 ft. hydroplane was shown, built of selected cedar and mahogany with bronze fittings throughout and copper fastened. It will carry three or four people and will make an ideal high-speed yacht tender. The motive power is supplied by a 50 h.p., four-cylinder Fox de luxe. The boat sells for \$2,150.

The Buffalo Gasoline Motor Co., Buffalo, N. Y., had a representative line of their marine engines on the main floor. Here the visitor could see the company's 25 and 40 horse-power "auto marine" engines and the 60 horse-power high speed motor, the 3 and 10 horse-power regular type for medium duty and the 9, 24 and 36 horse-power heavy duty machines. The 9 horse-power heavy duty was of interest as an addition to the Buffalo herd. This engine is built on lines similar to the 12 and 18 horse-power models, with cylinders 5 x 6 1/2 inches and develops its rated horse-power at 350 r. p. m. The 40 horse-power "auto marine" made its first appearance at a New York show this year, although it was brought out at the end of last winter. This is an extremely light and substantial engine designed for speed boats and fast runabouts. In addition to the engines themselves, the company had for those who wished to inquire more closely into the Buffalo line, drawings of two other new models, an 85 and 125 horse-power heavy-duty. Buffalo engines of all types have various refinements this year which should increase their already widespread popularity. One of these is an improved arrangement for getting warm air to the

carburetor and another is the addition of a carburetor throttle control lever conveniently arranged. The 25 h.p. auto marine motor has an extended base, which carries the clutch and also the new "positive drive" clutch and disengaging device. All Buffalo engines now have the Delco ignition system as part of their regular equipment. Buffalos have a good record for efficiency. Of the four boats that finished with perfect scores in the Scripps reliability cruise last season, three were powered with Buffalo motors.

The Thelma Motor Works, Detroit, Mich., exhibited its 1912 model engine. This machine is made in 4 sizes, 35-40 h.p. and 50-60 h.p. 4-cylinder, 60-70 h.p., and 90-100 h.p. 6-cylinder. These motors are designed with an eye to speed and more than one race has been won by a boat equipped with a Thelma engine. The New Comet II, powered with a 6-cylinder, 70 h.p. Thelma, made 33 miles an hour on a trial run, and well-known speed boats like the Thelma I, Thelma II, Echo and Comet are all driven by this make of motor. Although developing great speed and power, the engine is simple in construction, easily controlled under any speed and dependable at all times. It is built to occupy a very small space and sets low in whatever craft it may be installed. The Thelma Motor Works also design and build motor boats.

The Vim Motor Co., Sandusky, O., exhibited eight of their twenty models of marine engines in space No. X2. A number of improvements have been made in Vim motors this year, including a positive non-backfiring device, a double ignition system through separate spark plugs furnished by a Bosch magneto and battery, corrugated flywheel rims to facilitate starting and water-jacketed exhaust manifolds, which eliminate all exposed intake

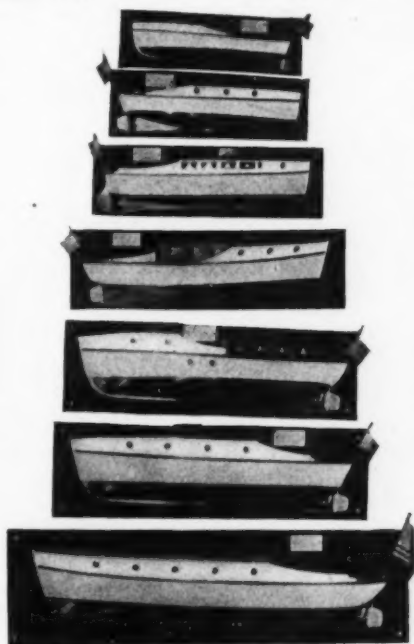
and outlet water pipes. Another improvement is the one adjustment carburetor in which the gasoline needle point regulating the flow of the fuel is automatically controlled by the throttle, giving the required amount of gasoline at varying speeds.

The Monitor Boat & Engine Co., Newark, N. J., had their exhibit in the balcony, where were displayed models of a completely finished 23 x 6.6 foot cabin cruiser, a 25 x 8 foot 6 inch cruising houseboat, a 30 x 8 foot flush sided cabin cruiser, a 30 x 8 foot cabin trunk and extension cabin cruiser, a 20 x 5 foot bridge deck cruiser, a 30 x 8 foot low trunk cabin day cruiser and a 38 x 9 foot flush sided cabin cruiser with a compromise stern. In addition, a line of the Monitor knockdown boat frames in both the open and cabin types was shown, completely ribbed so that the visitor could get a very good idea of the various timbers and method of construction. The Monitor Company manufactures knockdown frames for all types, styles and sizes of boats, from the small yacht tender to the large 60 x 15 foot passenger or freight boat. One noteworthy feature of this system of construction is that a customer is not confined to a strict line of catalogue models, but can practically dictate the essential features of the boat he has in mind.

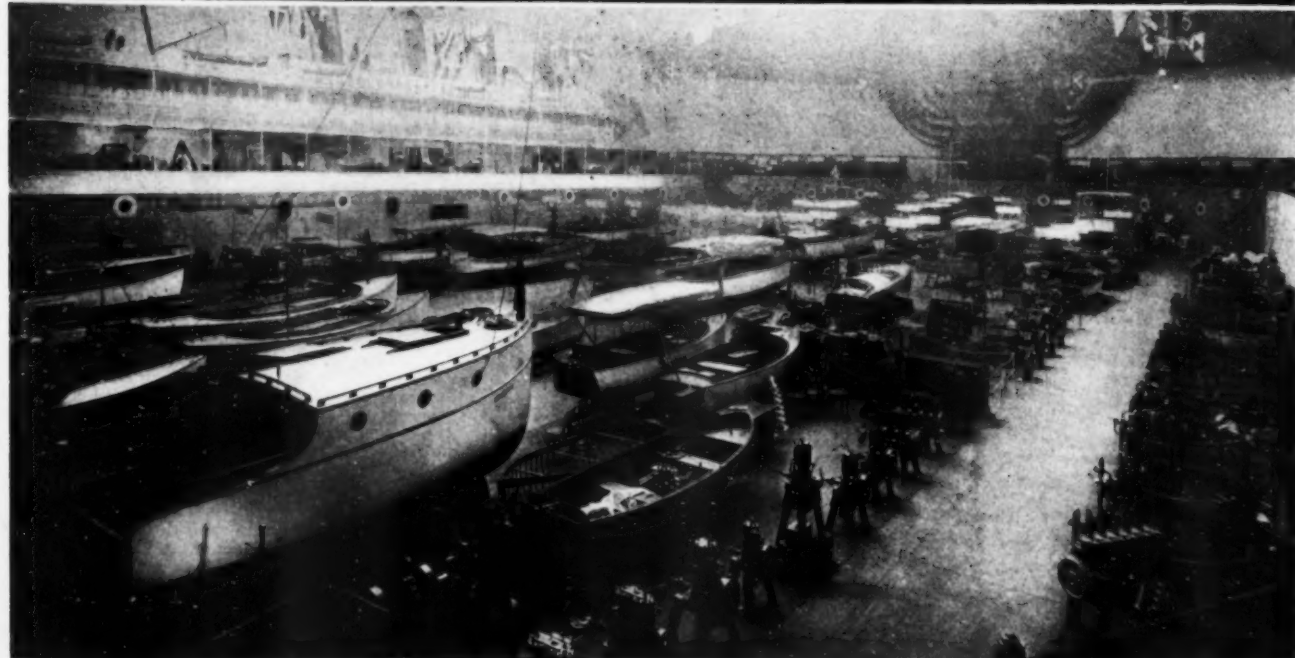
The H. C. Doman Co., Oshkosh, Wis., exhibited their line of Doman marine motors in space H. The display included a 6 h. p. 4 x 5-inch 2-cylinder engine, a 10 h. p. 5 x 6-inch 2-cylinder engine and a 12 h. p. 4 x 5-inch, a 20 h. p. 5 x 6-inch, a 30 h. p. 6 x 6-inch and a 32 h. p. 6 x 8-inch, all built with 4 cylinders. The last named motor is a heavy duty, long stroke machine developing its rated horsepower at 400 r. p. m., and the fact that it used both gasoline and kerosene for fuel, made it of special interest to the visitor.

The Gray Motor Co., Detroit, Mich., had their exhibit on the main floor. The Gray people showed a complete line of their marine motors, including a 3 1/2 h. p., 4 1/2 h. p. and 6 h. p. single cylinder, a 7, 8 and 12 h. p. single cylinder, a 12, 14, 16 and 24 h. p. two-cylinder, and the three-cylinder, 21 and 36 h. p. models. The company also had on display a representative of their "Gray Flyers," a 6 horse-power double-cylinder engine and its team-mate, the "Gray Leader," a remarkable little 3 horse-power, single cylinder motor. In addition to these engines a 14 horse-power two-cylinder model "T" was shown equipped with the Gray gear on an extended base, also a 24 horse-power two-cylinder model "T," equipped with a Paragon gear and Bosch high tension magneto. An interesting feature of the Gray exhibit was a large painting 10 feet square, showing a sectional view of a single cylinder model "T" motor with all parts carefully indicated, so that the enthusiast and inexperienced visitor alike got an excellent idea of the working of this type of engine. Small reproductions of this painting were handed out to the visitors. Just to keep in the public mind the fact that the Gray Company also makes stationary engines, a 1 1/2 horse-power and a 4 horse-power four-cycle motor of this type were shown.

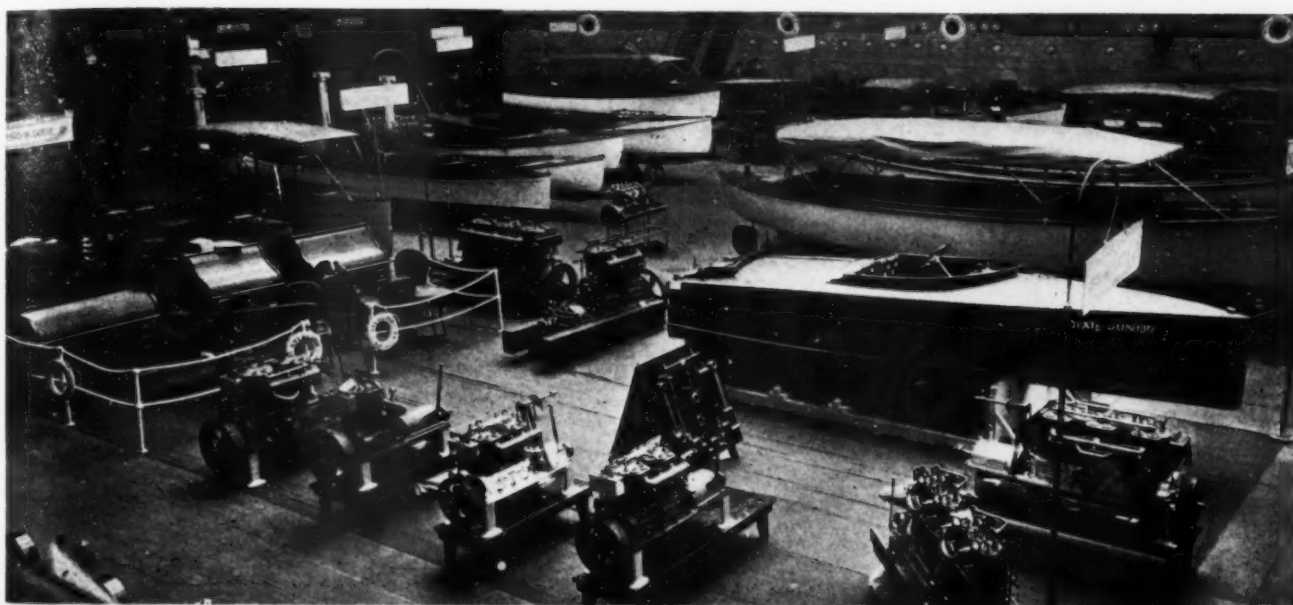
August Mietz, New York City, had space on the main floor where were seen a 10 horse-power two-cylinder Mietz & Weiss marine engine, a 75 horse-power reversible marine oil engine, a 12 horse-power horizontal stationary engine and a sample of the Mietz & Weiss reverse gear. The 75 horse-power attracted considerable attention through its reversing device.



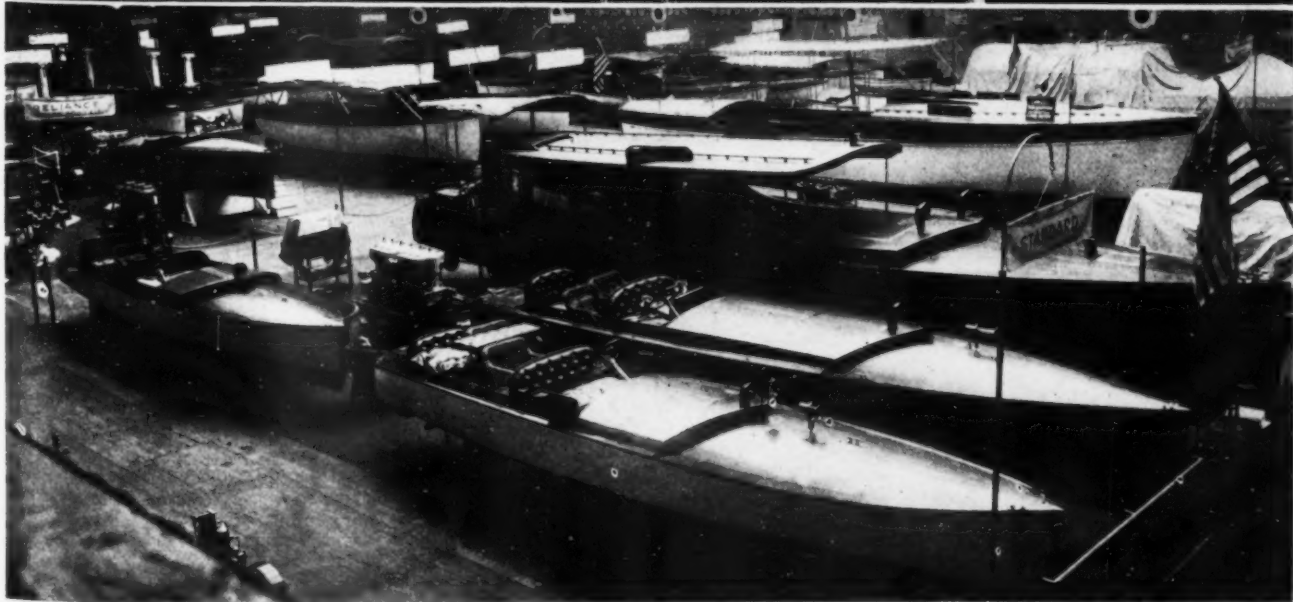
Monitor Boat and Engine Co.'s Display of Models.



Views showing various parts of the arena of Madison Square Garden. The balconies, restaurant and concert hall also were filled with exhibits.



PHOTOGRAPH BY ROSENFELD



More general views of the show. The remarkable picture in the middle was taken on the opening night and conveys an idea of the popular interest in the show. The finished Dixie Junior is shown above. The space beneath her became such a popular rendezvous for amateur designers, that it was necessary to drape her underbody.

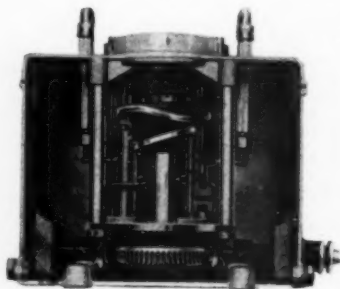
THE NEW YORK SHOW

The Bosch Magneto Co., which has its factory at Springfield, Mass., had a most interesting and comprehensive display of ignition systems and specialties in the balcony. A large line of magnetos were on view in operation and sectionalized, so that the machines could be thoroughly inspected and their working parts readily understood, even by the novice. A feature that attracted considerable attention was the ZR type of magneto upon which the Bosch Company has concentrated a good deal of attention with a view to making it absolutely waterproof. Their success in this endeavor was demonstrated by a mechanical dredge which poured water over the magneto, proving very effectively its power to go on working although thoroughly drenched. The Z types and the two-spark magnetos were also shown, the latter being the machines which were used so successfully in various automobile and motor boat competitions held during the past year. Examples of the Bosch dual ignition system with self-contained contact breakers with universal distributor were on display, as well as the "two independent" system with separate distributors. Specially designed magnetos for very high speed engines, known as the HL types, constructed to produce four sparks at each revolution, drew the attention of the 6 and 8-cylinder man, while the small boat owners were attracted to the exhibit of the DU 4 type in independent, dual or duplex systems. Low-tension magnetos were represented by the K types which operate in connection with magnetic plugs.

The Monarch Valve Co., 112 Front St., Brooklyn, N. Y., exhibited their line of gas engine specialties in space No. 27. Among other things the company manufactures carbureters, check valves, auxiliary air valves, stuffing boxes, stern bearings, etc. The Monarch carbureters have been made even more desirable than before this year, by the introduction of various refinements and improvements in construction.

The Elencee Co., 1779 Broadway, New York City, exhibited their fireless cooker in space No. 38. The display consisted of a one-compartment cooker, which is especially suited for use on small boats. It is so constructed that it can be used as a seat, and its capacity is such that it can roast, bake or cook four different things at the same time. These cookers are lined throughout with pure aluminum and have utensils of the same metal. The cooking is started on a small alcohol stove or similar device and the food is then placed in the cooker where it remains without further attention until ready to serve. With this device, the cooking cannot be overdone nor can the food burn. Cereals, etc., can be placed in the cooker at night and be ready for breakfast in the morning. These cookers are manufactured by the Manson Campbell Co., of Detroit, Mich., and Chatham, Canada.

The K-W Ignition Co., Cleveland, O., exhibited their new "Special" magneto for motor boats and their new searchlight in space No. 36 in the balcony. The magneto is made in one size only and the body has the well-known K-W principle of stationary winding and revolving rotor. The magneto can be used on any number of cylinders by having a coil for each cylinder and each machine has a special K-W coil furnished with it, wound exactly to suit its requirements. The searchlight is made of one piece of heavy brass highly polished and has a true parabolic reflector of burnished silver drawn with steel dies, thus giving an absolutely true parabola without the small rings



Bosch oiler.



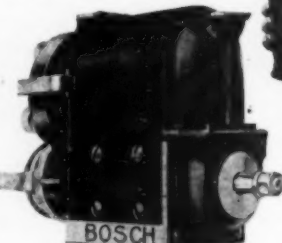
Velox cleaning and polishing rag.



Fireless cooker exhibited by the Elencee Co.



Monarch intake strainer, made by the Monarch Valve Co.



Bosch magneto.

Pyrene extinguisher, showing method of operation.



that usually show on spun reflectors. The K-W Company also makes magnetos of other sizes, both high and low tension, as well as spark coils and master vibrators.

Marburg Bros., Inc., 1777 Broadway, New York City, exhibited in the balcony. Here were shown all types of the Mea magneto and S.R.O. ball bearings, as well as an assortment of the well-known Lodge plug. The practicability of obtaining a two-point ignition with a Lodge plug and a standard Mea magneto was demonstrated. The Mea is easily recognizable by its bell-shaped magnets placed horizontally and in the same axis with the armature instead of, as is usual in horse-shoe magnets, placed at right angles to the armature. By this method the same quality of spark is produced no matter what the timing may be. The Lodge spark plugs, made in both single and double-pole types, and the S.R.O. ball bearings are both imported products handled by Marburg Bros.

The Velox Polish Mfg. Co., 672 Eagle Ave., New York City, exhibited in the balcony. The company manufactures the Velox metal cleaning and polishing rag, which, without the aid of any polish, removes dirt, tarnish or oxidation from brass, copper or steel, no matter how neglected the metal may have been, and in addition will take rust spots from iron or steel. Furthermore, if metal is cleaned a few times with this rag, the oils and greases which enter into its composition will leave a thin skin on the surface of the metal preventing quick oxidation. The rag is made in two sizes selling at 10¢ and 25¢.

The Pyrene Manufacturing Company, of New York City, exhibited in space No. 7 in the Accessories Department, where they showed in addition to their models of the Pyrene extinguisher an actual demonstration of its efficiency in extinguishing electric arcs. The Pyrene extinguisher uses a combination of powerful gases in liquid form which, when brought into a temperature of 200 degrees or over, forms a dense, white gas blanket about five times as heavy as air, which surrounding the fire, destroys the oxygen present and excludes fresh oxygen. It is especially adapted to motor boats and has been approved by the Department of Commerce and Labor for use on this type of craft as well as for steam vessels.

The Edison Storage Battery Co., Orange, N. J., showed specimens of their storage batteries in section X on the main floor at the east end of the Garden. Besides the batteries themselves there were three sizes of complete boat lighting outfits comprising engine, generator, battery and lamps, all shown in operation. This feature was of great interest not only to the man who contemplated putting an electric lighting outfit in his boat, but to the visitor who just liked "to see how things worked." Edison batteries are adapted to every kind of marine service from the ignition of twenty-foot motor boats up to lighting the 200-foot cruiser.

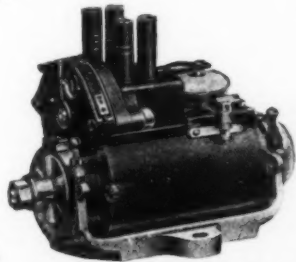
The Dayton Electrical Mfg. Co., Dayton, Ohio, displayed their full line of marine lighting equipments and accessories in space No. 39 on the balcony. One of the attractions in the display was an arc searchlight equipment. Dayton lighting equipments are all of the combination dynamo and storage battery type, in which the battery current is used for operating the lights and igniting the engine. This method insures a steady light regardless of whether the engine and dynamo are running or not, the batteries really acting as a reservoir to be drawn upon as desired.

C. D. Durkee & Co., of New York, exhibited motor boat fittings and specialties in space No. 33. Among these were windlasses, including the Andrade automatic windlass, the Seapruf dry battery and the new Durkee spark plug. A handy little contrivance handled by this company is the Seapruf boat switch with trouble lamp attachment for locating motor trouble at night. Durkee's combination taffrail log and speed counter was also shown. In connection with the above, the "Motor" dry chemical fire extinguisher was on display.

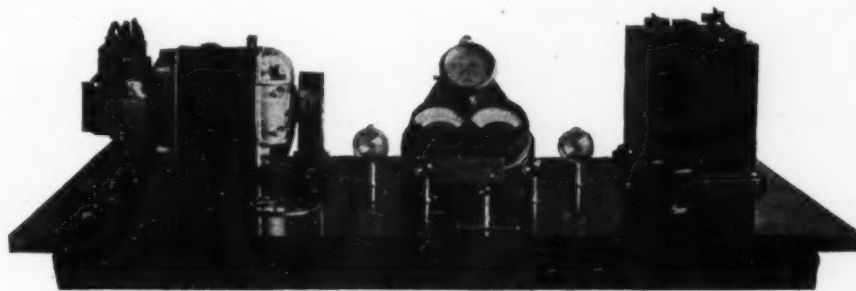


Motor boat lighting outfit displayed by the Dayton Electrical Manufacturing Co.

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Marburg Brothers'
Mea magneto.



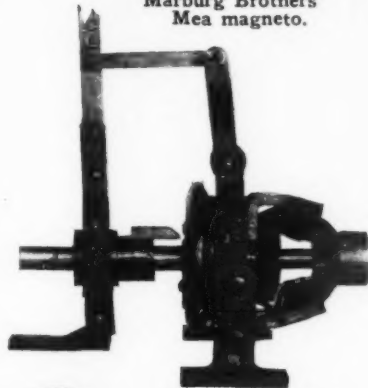
Delco lighting and ignition display.

The Dayton Engineering Laboratories Co., Dayton, O., had their display in space No. 51 in the balcony where they exhibited a complete line of Delco battery ignition equipment, comprising some sixty-five different models. They also showed for the first time a new combined electric lighting and magneto ignition system which they are offering for the coming season. This was effectively demonstrated by means of a specially built, motor operated model.

The Ajax Reverse Gear Co., of New Haven, Conn., occupied space No. 32 and exhibited their improved reverse gear in two models, one with the gear case closed and the other, a more recent design, with an open case showing the action of the reversing mechanism. These gears consist of four hardened steel, beveled gears, cut with coarse, heavy teeth to stand all kinds of abuse as well as ordinary wear. A novel feature of the newer model is the exposure of the working parts, so that the operator does not have to remove any part of the gear to make an examination. This feature also reduces the weight about 20%. V-shaped frictions are used in these gears, both forward and reverse, insuring positive action and permitting oil to remain in them at all times. The gear can be reversed as fast as the operator can manipulate the lever and it has a record of 56 reverses in 15 seconds, 28 each way. The 15 h.p. size, which is in the exhibit, was tested for four weeks on a 40 h.p. Columbia motor in a speed boat. A 10 h.p., also in the exhibit, was in continuous service for two years in a demonstrating launch and was taken apart so that the wear could be noted by the visitor.

Wheeler & Schebler, Indianapolis, Ind., showed a full line of their carbureters, check valves and strainers in space No. 3. The feature of the carbureter line was the model D which is especially fitted for use on marine motors. It has a butterfly shutter in the air intake which can be closed when starting, thus drawing a rich mixture into the cylinders and an improved air valve adjusting screw which prevents the lock nut from working loose and allowing the air adjustment to change. This model is made in six sizes from 1/2 inch to 6 inches. The Schebler strainer is so arranged that no gasoline can get into the carbureter without first passing through a fine mesh screen and gauze. The heavier particles of dirt and water lodge in the bowl of the strainer, whence they are drawn off by means of a drain cock. The various parts of the strainer can be easily removed for cleaning, renewing the gauze, etc. Schebler carbureters have been specified as standard equipment by many of the leading manufacturers of marine engines.

The Wilmarth & Morman Co., Grand Rapids, Mich., occupied spaces 35, 36 and 37 in the concert hall. Here was displayed a full line of the Sintz reversing propellers and timers. The Sintz wheel gives maximum speed, perfect strength and absolute control and costs less than a solid wheel and reverse gear outfit. A detailed description of this wheel will be found in the Yard and Shop section of this issue. The Sintz timer combines simplicity, efficiency and durability. Motor boatmen using this timer may have noticed that the contact points and fiber have practically the same amount of surface wear, giving the timer a long life. This device is manufactured in three styles.



Ajax reverse gear.

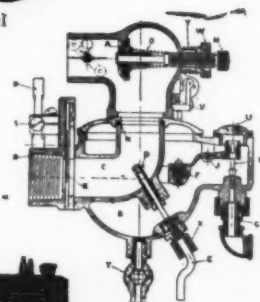


Sintz timer.

Sintz Reversing Propeller.



Schebler Model D carbureter.



Edison batteries.



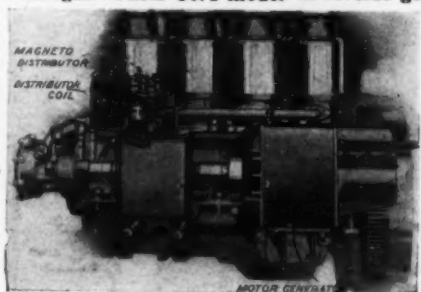
New K-W searchlight.

Michigan Wheel Co.'s "Dixie" Propeller.

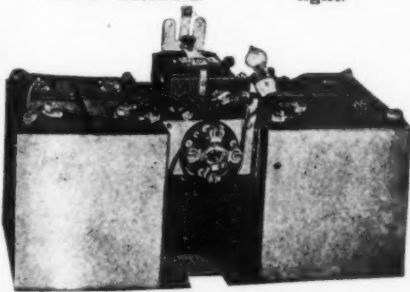


Apple Electric Co.'s marine searchlight.

Michigan Wheel Co.'s model A reverse gear.

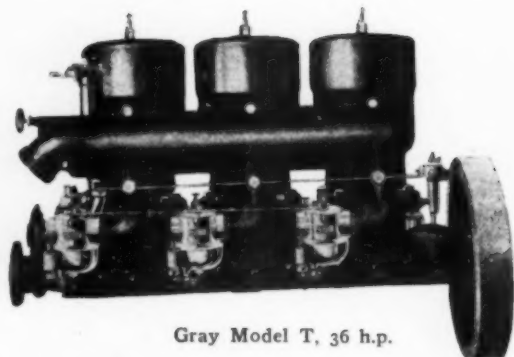


Delco generator.

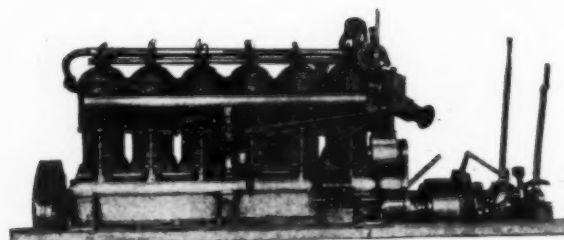


Ignition system, by C. D. Durkee & Co.

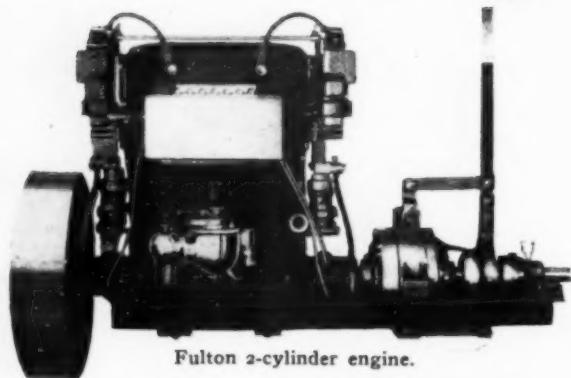
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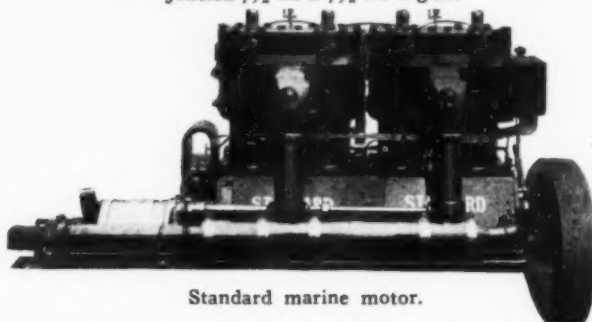
Gray Model T, 36 h.p.



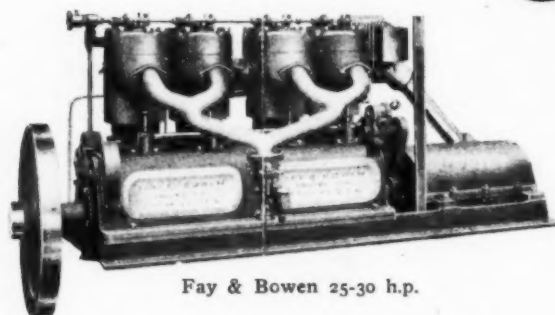
Jencick 7 1/4 in. x 7 1/2 in. engine.



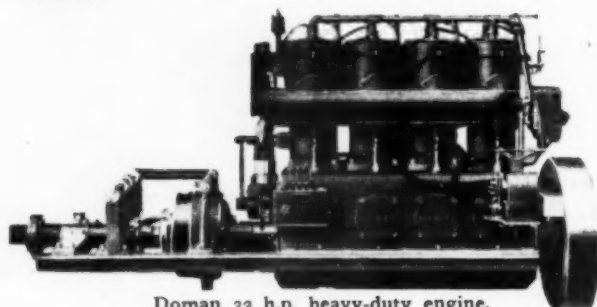
Fulton 2-cylinder engine.



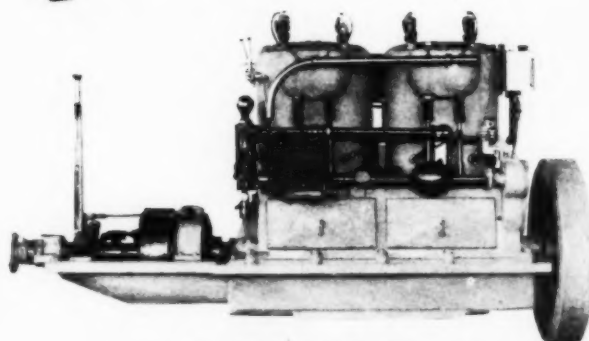
Standard marine motor.



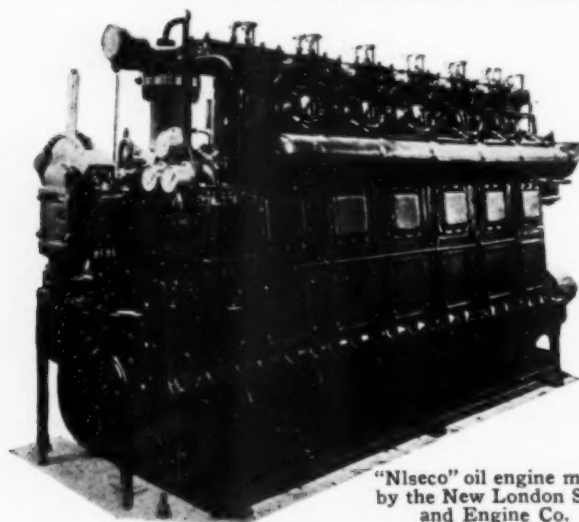
Fay & Bowen 25-30 h.p.



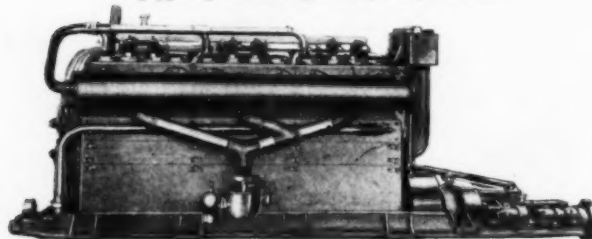
Doman 32 h.p. heavy-duty engine.



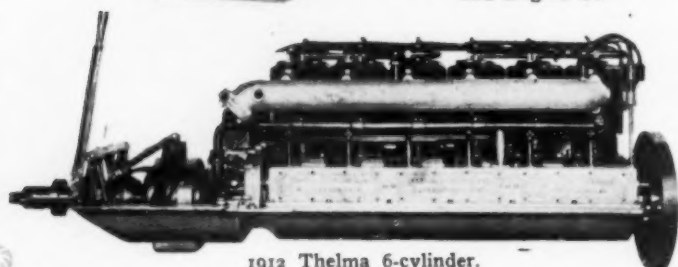
25-35 h.p. Sterling heavy-duty motor.



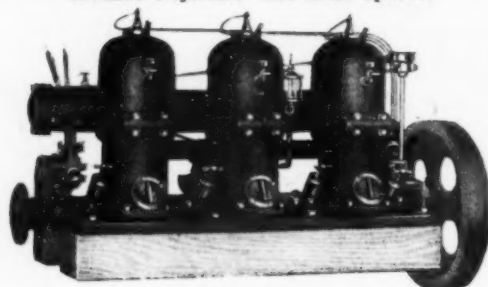
"Nlseco" oil engine made by the New London Ship and Engine Co.



Holmes 6-cylinder Life Boat Special.

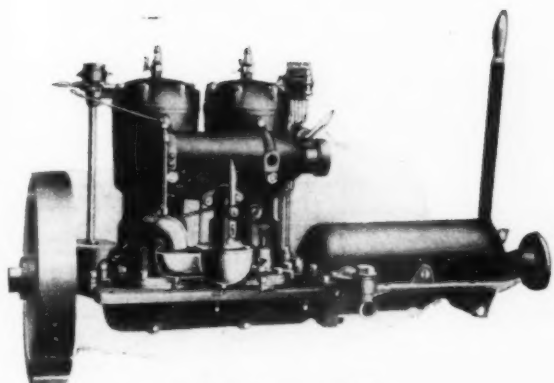


1912 Thelma 6-cylinder.

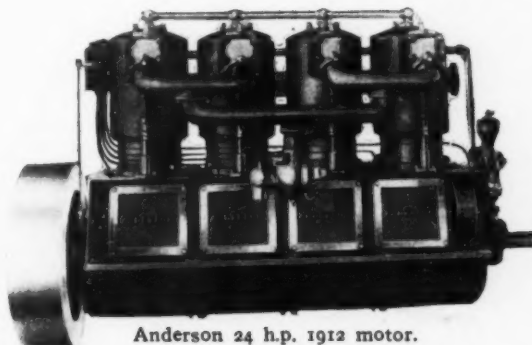


Vim 27 h.p. engine.

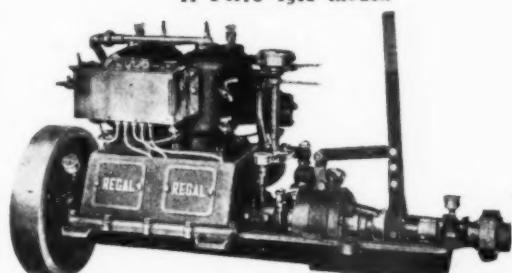
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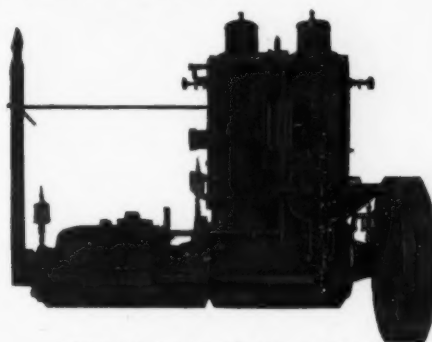
A Ferro 1912 model.



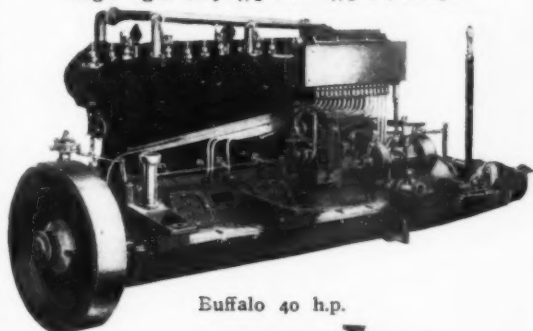
Anderson 24 h.p. 1912 motor.



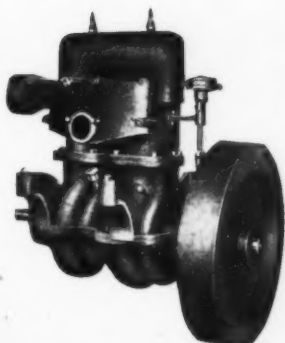
Regal light duty 4 1/2 in. x 4 1/2 in., 6 h.p.



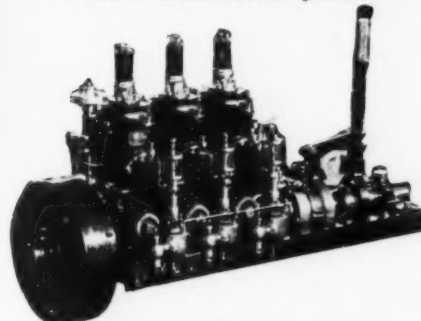
Mietz & Weiss double cylinder.



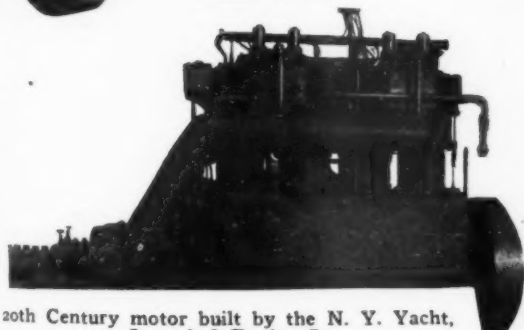
Buffalo 40 h.p.



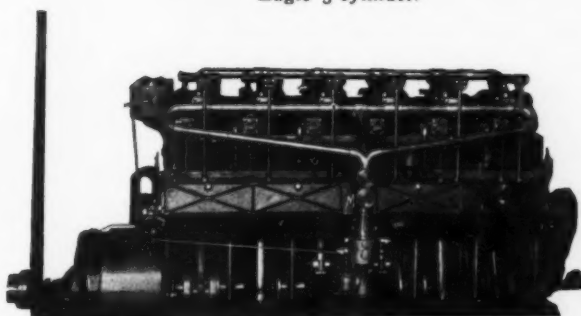
12-h.p., 2-cylinder Xargil engine.



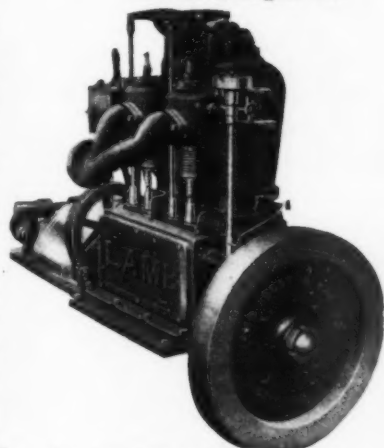
Eagle 3-cylinder.



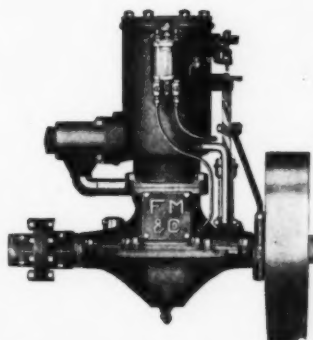
20th Century motor built by the N. Y. Yacht, Launch & Engine Co.



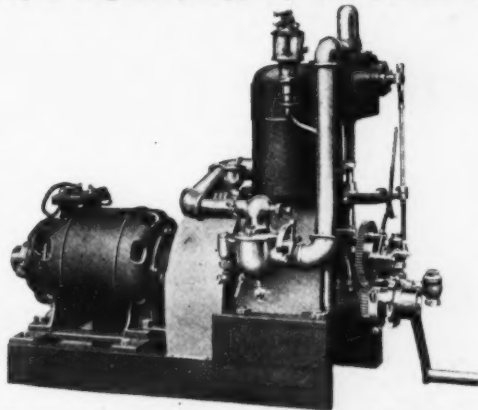
Murray & Tregurtha 70 h.p., 6-cylinder open base motor.



Lamb 4 1/2 in. x 6 3/4 in. engine.



Fairbanks-Morse 7 1/2 h.p. type K engine.



Generator outfit exhibited by Murray & Tregurtha.

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The Michigan Wheel Company, Grand Rapids, Mich., had their complete line of propeller wheels, reverse gears, etc., on display in the balcony. The company is one of the largest manufacturers of marine specialties in the country. Reverse gears are made in four models, in sizes to meet all requirements, and the company's line of propeller wheels is unusually complete, including wheels for towing, semi-speed and racing boat wheels, weedless wheels and two and three-blade reversible wheels, made both of bronze and cast-iron. In addition to the reverse gears and wheels, the company manufactures a very comprehensive line of marine hardware, including steering wheels, carbureters, bilge pumps, whistles, bells, air pumps, flag-pole sockets, cleats, and, in fact, almost everything that the motor boatman might want in the way of accessories.

The Apple Electric Co., of Dayton, O., makers of the well-known "Aplco" storage batteries and electric lighting systems for motor boats, automobiles and residences, had their exhibit in spaces 41 and 42. The display consisted of a representative line of motor boat electric lighting systems, lamps and fixtures. Included in the exhibit was a new, bullet type searchlight which the company is offering this year in addition to their regular line.

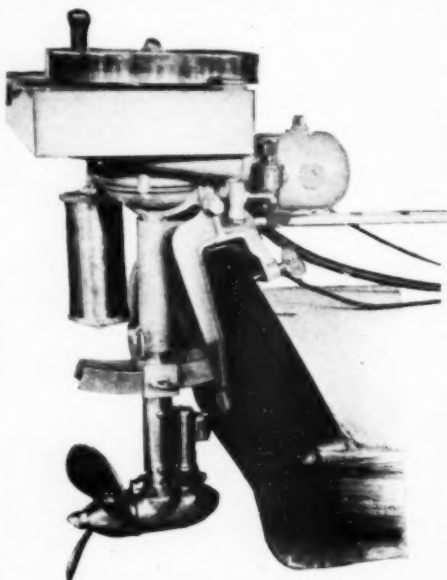
Hector MacRae, 316 St. Paul St., Baltimore, Md., exhibited in space 54 where the yacht lighting and ignition systems manufactured by him were shown. A feature of the exhibit were the "Champion" accumulators, six types of which are designed for yacht lighting. Champion outfits are built for hard usage and in the marine field, consist of a dynamo run by a belt from the engine, a storage battery to operate the lights when not running and a switchboard to control the whole. In addition to the generating equipments, MacRae also manufactures electric lamps and fixtures, searchlights, etc.

The Gray-Hawley Mfg. Co. of Detroit, Mich., were housed in space No. 48 this year. The company makes the well known "Auto-chime" whistles, as well as complete whistle outfits for all sizes of motor boats, burned gas compressor outfits, mufflers, spark and throttle controls, gasoline filters, fog bells, hand-pump whistles, special hose fittings and other motor boat and motor car accessories. The company showed something new this season in the shape of a combination aft light and flag pole. This pole is made of hollow brass and so arranged that the light may be raised and lowered at will. The Holophane globe supplies a ball of light which can be seen for a long distance and is operated by wires running from batteries below the deck up through the inside of the pole. This is a device which will undoubtedly appeal to all of the boating fraternity.

The Biddle Hardware Co., Philadelphia, Pa., exhibited samples of Monel metal specialties in the balcony. The Monel metal propellers manufactured by this company are noteworthy in that the driving surfaces are planed, ground and buffed to an absolutely true surface, thus insuring them against any variation in the pitch of the blades, which variation is a common fault in many ordinary stock propellers. These wheels, as well as their line of deck hardware, have been designed especially for the Biddle Co., with an eye to the requirements of the modern motor boatman. In the same space, Morris M. Whitaker, naval architect, of New York City, had a series of sketch designs of boats varying in size from 26 feet to 100 feet and talked motor boat design to many interested visitors.

Valentine & Co., 257 Broadway, New York City, had spaces 46 and 47. There were found samples of the company's "Valspar" spar varnish. A submarine boat floating under water in a large glass tank supported by davits was shown which had been varnished in alternate bands with Valspar and various other varnishes, and during the show the boat which was a uniform shining black at the beginning gradually developed light stripes as the inferior varnishes revealed themselves by turning white. On a large board was shown the effect of water on thirty-six of the best varnishes. The exhibit also contained a series of panels, over which running water continually flowed. All the panels except those varnished with Valspar gradually turned white as the test proceeded.

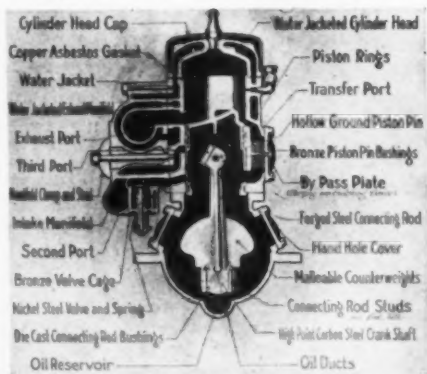
The Evinrude Motor Co., Milwaukee, Wis., exhibited their detachable row-boat and canoe motor in space No. E. The adaptability of this machine to any make of light craft as usual made it of much interest to visitors. This engine is a two-cycle, $2\frac{1}{2} \times 2\frac{1}{2}$ in. ma-



Evinrude Detachable Motor showing how it can be used on an ordinary row boat.



MacRae "Champion" switchboard.



Large Diagram showing section of Gray Motor.

chine developing $1\frac{1}{2}$ h.p. at 800 r.p.m., but having a speed range up to 1,000 r.p.m. It is so made that it can be clamped in a few minutes to the stern of a row-boat or similar craft, and will give a speed of about eight

miles an hour. It weighs only 50 lbs. and can be easily carried along on an outing and attached to a hired row-boat for an afternoon. The tiller is clamped to the propeller sleeve and swings the propeller point in different directions, thus steering the boat as easily as with a rudder. By means of a special canoe attachment, any canoe can be fitted to take this motor, so that it can be put in or taken out in a short time, according to the owner's desire for power or paddle.

The Bayonne Casting Co., Bayonne, N. J., showed their line of Monel metal propellers in two standard designs and deck fittings, including cleats, chocks, flag sockets, ring bolts, etc., in space No. 20 in the balcony. Monel metal in sheet form was also on exhibition, together with screws, nails, rivets, sheathing tacks, etc. This metal makes ideal sheathing for boats used in salt water and its superior qualities were demonstrated to those interested by means of test specimens. In the booth were seen photographs of battleships, torpedo boat destroyers, hydroplanes and commercial vessels, fitted with Monel metal propellers.

The Carlyle Johnson Machine Co., Manchester, Conn., exhibited their friction clutches and reverse gears in space No. 26 in the balcony. The friction clutches are made in five sizes to fit any shaft up to 3 inches in diameter and a cut-off coupling type has been designed for use in motor boats. Of special interest in the exhibit was the new type of reverse gear which the company is offering for 1912. It is compact and neat, silent and powerful, wholly encased, but easily accessible and can be used on any engine from 1 to 10 horse-power with a heavy duty type adapted to engines up to 30 horse-power. A detailed description of this gear appeared in the Yard and Shop section of February MoToR Boating.

The Holmes Motor Co., West Mystic, Conn., with a New York office at 1 West 34th St., exhibited two six-cylinder, long-stroke engines in the restaurant. The first of these was a 40 h.p. $4\frac{1}{2} \times 6\frac{1}{2}$ in. engine, one of the type which has been adopted by the United States government for use in life boats. Several changes have been made in this motor during the past year, all tending toward greater simplicity of construction. The bore has been increased from $4\frac{1}{4}$ in. to its present size. The water jackets have been doubled in area and the connecting rods hollowed to provide for lubrication of the bearings. This was formerly accomplished by means of two copper tubes on each side of the connecting rod. The valve lifts are now equipped with rollers and the lift of the valves has been increased from $\frac{3}{8}$ in. to $\frac{1}{2}$ in. The cams have had attention, with a view to extremely quiet running, and the already large size of the bearings has been added to. The other motor shown, a 60 h.p., 6×9 in., is the model with which the Caroline made 582 knots in 57 hours and 40 minutes against adverse weather conditions and won Mr. Heart's Reciprocity Race. The Holmes people are now working on a 250 h.p., six-cylinder machine to be operated on producer gas.

The Anderson Engine Co., Shelbyville, Ill., with a main office at 160 North 5th Ave., Chicago, exhibited their line of marine engines in block F on the main floor. Included in the exhibits were a 4 h.p. single-cylinder $4\frac{1}{2} \times 5$ in. motor, a two-cylinder 12 h.p. 5×6 in., a four-cylinder 24 h.p. 5×6 in., and a $37\frac{1}{2}$ h.p. three-cylinder 7×8 in. All these engines were of the T-head pattern. The single cylinder was arranged with the intake forward and exhaust aft and had the splash system of lubrication with a Paragon oiler fitted to the cylinder. The 12 h.p. had mechanical intake valves arranged on opposite sides, and McCanna force feed mechanical lubrication. The pump was of the plunger type and the exhaust manifold water-jacketed. A Schebler carburetor was used. The four-cylinder engine was built on the same general lines as the two-cylinder, except that it had a Detroit force feed lubricator and the Bosch dual ignition system. The 1912 model which was exhibited had slight alterations in the bronze circulating manifold and the fastening arrangements for the flywheel from last season's machine. The three-cylinder 7×8 in. closely resembled the four-cylinder in design and equipment, and had in addition an air-pump of unique design.

Diesels for American Submarines.

A Description of the Seventeen 450 H. P. Nlsecos of the Diesel Type Now Under Construction in This Country for the United States Navy.

By J. Rendell Wilson.

FOLLOWING close upon the development of the marine Diesel-type oil engine in Great Britain and the Continent of Europe, a new plant has been erected at New London, Connecticut, for the construction of this class of machinery by the New London Ship & Engine Company, who, by the way, are connected with the Electric Boat Company of Groton. The latter firm are now building 17 submarines for the U. S. Navy, each of which will be equipped with two 450-h.p. Diesel-type engines, now being built by the New London Company under license from the Maschinenfabrik Augsburg Nürnberg, A. G. of Germany. In addition to this naval contract the New London Company have also a number of big engines on hand for commercial craft, and it should not be long before America has her own Diesel-driven mercantile fleet.

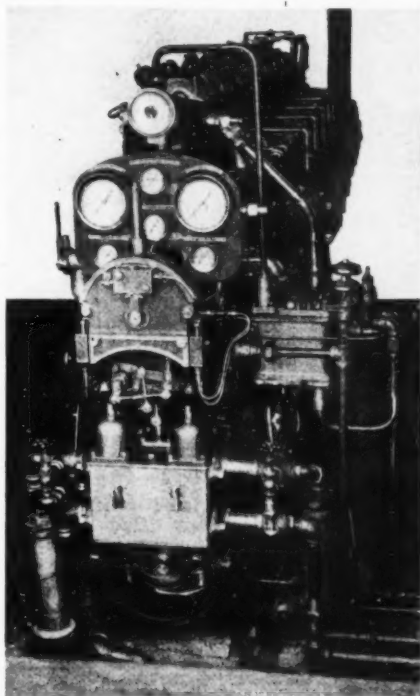
Unlike gasoline engines, there is no limit of size for engines of this class, and at the present time several marine oil engines designed to develop over two thousand horsepower (2,000 h.p.) per cylinder are under construction and well towards completion in Europe, so there is a wonderful field for development. In fact, heavy oil engines seriously tend to oust steam machinery in vessels of the largest size. Therefore the New London Company deserve to be congratulated for being the first firm in the States to recognize this, and commence building on a large scale. The undertaking is no small one, as special plant is necessary, owing to the extreme accuracy required in the machinery of the piston, cylinders, and other parts.

This will be realized when I mention that a cylinder compression of close upon 600 lbs. per square inch has to be made and maintained by the pistons and rings from 100 to 400 times per minute in each cylinder, according to the engine speed.

"Nlsecos" will be the name of the engines turned out at the New London works; but they must be in no way regarded as experimental, as the parent firm at Nürnberg, Germany, have been building heavy oil motors for years, and Nlsecos engines will be built from their designs, with some improvements.

The sectional drawing of the six-cylinder engine, which develops 300 h.p. on the two-cycle principle, will give a general idea of the design. On the crankshaft it will be noted that there are two air compressors in addition

In view of the recent announcement that the German Government is to install Diesel motors in its battleships, the fact that the United States Government has already recognized the advantages of the type and is actually having seventeen engines built, and in this country, is particularly interesting. —Editor.



A 150-h.p., high-speed, medium weight Nlsecos engine of the Diesel type.

to the six cylinders, and that each of the working pistons is stepped; that is to say, has a double diameter, the lower and larger portion of each piston acting as a scavenging compressor. The lower piston also serves as a cross-head, and relieves the cylinder walls of all side thrust.

On the upstroke of each working piston, the

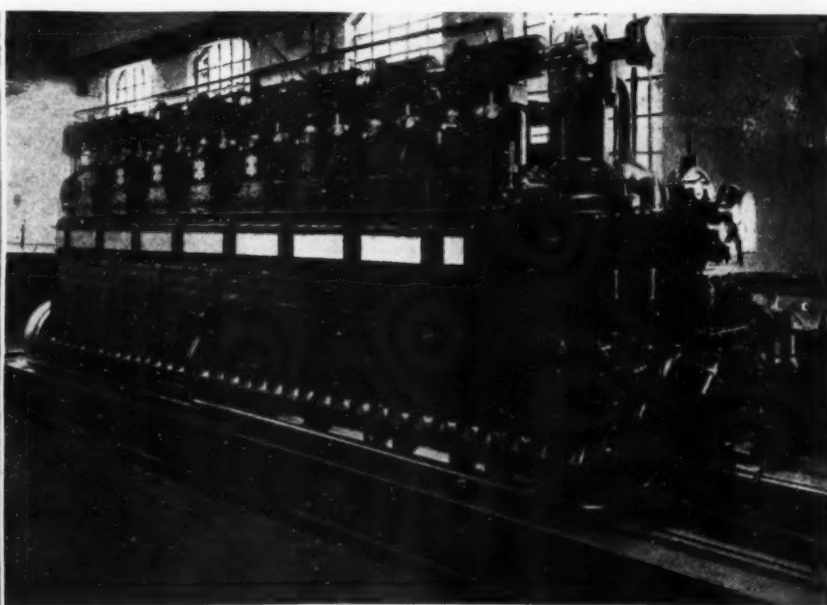
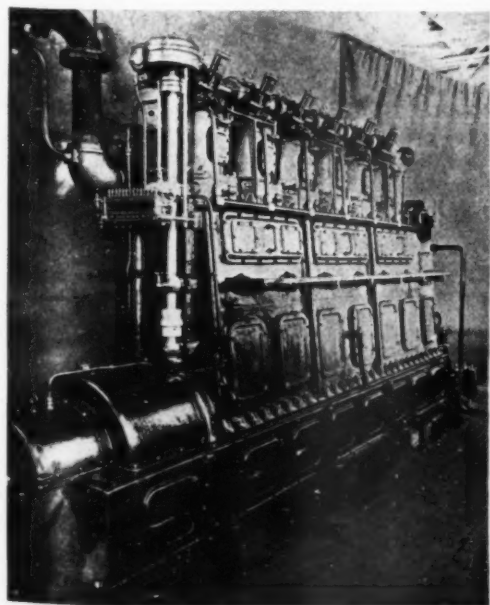
air in the cylinder head is compressed to 500 lbs. per square inch, and just as the piston reaches the top of the stroke a cam, on an overhead cam-shaft, opens the fuel valve in the cylinder head, and fuel is injected at a pressure of about 860 lbs. per square inch. Combustion is instantaneous, because of the enormous heat produced by the high compression. It will be seen that electrical, or hot bulb, systems of ignition, with their complications, are entirely dispensed with. At the end of the down, or working stroke, of the piston, ports are uncovered and scavenging air is blown through at a pressure of 5 lbs. to 7 lbs. per square inch. This instantaneously drives out all burned gases, and also tends to cool the piston-top and cylinder walls.

For the scavenging air there is a reservoir in the upper part of the crank-case, and there is a pipe leading to a valve in the cylinder head, this valve being actuated off the cam-shaft by a rocker-arm lifted by a cam. The cam-shaft is driven through helical wheels by a vertical spindle off the crank-shaft at the after end of the engine.

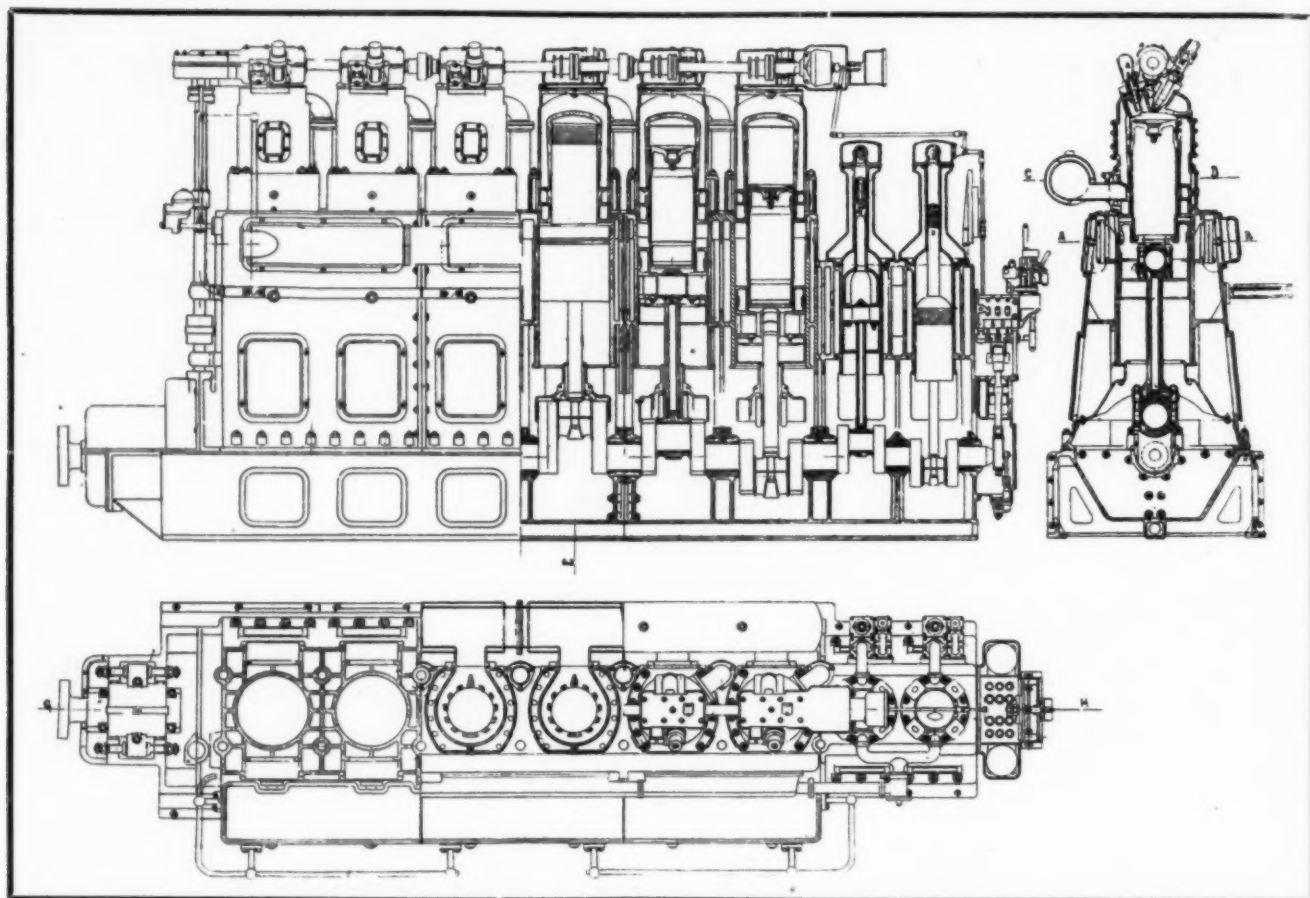
The high-stage compressors (for fuel injection and reversing the engines) of which there are two with some types, and one in others, are situated at the forward end, as are the lubricating and water-cooling pumps. Both the compressors and the main cylinders are amply water-cooled, as is, of course, the lubricating oil.

No auxiliary reversing gear is required, as all Nlsecos engines are directly reversible. In connection with the design of the vertical spindle, which drives the cam-shaft, there is a notable feature. Instead of being solid for its length, it is fitted with a clutch-coupling which, when the motion of the engine is reversed, allows a slip of 30 degrees, before taking up the drive. This action brings the cams that actuate the fuel and scavenging valves into the correct position for running astern.

Reversing is very simply carried out by means of a single hand wheel, which opens the compressed-air valves in the cylinder head, and, at the same time, shuts off the fuel supply until the cams are in the correct position, the air, of course, being admitted to the piston which is in the correct position for running astern. The whole action is extremely simple, and is carried out by a slight turn of the control wheel in but a few seconds. The same air valves are used for starting, air from the



A heavy slow-speed Diesel of 300 h.p. and a high-speed model of 850 h.p., both of which are now being manufactured in this country.



Sectional view of the 300-h.p. two-cycle Niseco oil engine. Each of the working pistons is "stepped," the lower portion acting as a scavenging compressor. The upper piston compresses the air of the charge to 500 pounds per square inch, and at the top of its stroke the fuel is injected at a pressure of 860 pounds, combustion being instantaneous due to the heat of compression. The two smaller cylinders supply compressed air for the injection of the fuel.

high-stage compressors being stored in steel bottles for this purpose at about 860 lbs. per square inch, and the bottles contain enough air for many starts, and are being constantly charged automatically when the engine is running. The fuel and scavenging valves are mounted in cages, for facilitating removal, should they require cleaning or grinding in. When lifted out the piston top and combustion chamber can be freely inspected.

Fuel consumption is an important point, and with Niseco engines varies from 0.5 lb. per horse-power hour, down to 0.44 lb. of oil having a net heat value of 18,000 British ther-

mal units per lb. (10,000 calories per kg.) with a specific gravity of 0.85 to 0.95, and a flash point of between 120 and 360 deg. F. This fuel can be obtained in the States at 3 cents per gallon, and, unlike gasoline, is quite safe to handle in large or small quantities.

Niseco engines are made in the light-weight, high-speed type, like those being built for the U. S. Navy and for yachts; and in the heavy-weight, slow-speed classes for commercial vessels and warship propulsion, where head room is not such an important factor in determining the height and stroke of the engine.

Regarding the material used in the con-

struction of Niseco engines, the crank cases and frames are of strong manganese bronze, as are the bed plates, while the checker plates and covers are of aluminum, except in instances where they are likely to come in contact with salt water. Fine grain cast iron is used for the pistons, cylinders and piston rings, while the crank shafts, which are of hollow section, are of special nickel steel.

Finally, I may say that at present the New London Company are only turning out single-acting engines, but no doubt at a later date they will start work on double-acting engines in high powers, as have the parent

Practical Pointers for Boatmen.

By A. D. Hard.

DRY cells should be placed in a snug-fitting box and melted paraffine poured around them. The box should contain two sets and should be covered with a slip cover made of thick rubber cloth similar to that used for buggy side curtains. When it becomes necessary to place new cells in the box simply draw out the old cells from their pasteboard holders and slip new ones in without disturbing the paraffine.

The switch should be a three-point affair, arranged so that either set of batteries may be turned on at will. If one set is weak the strong set should be used to start the engine and the weak set then turned on. By doing this way almost double service may be derived from dry cells.

For quick and certain starting use a priming mixture of equal parts of ether and gasoline. It should be kept in a common squirt oil can with a cork on the tip.

A one-gallon reserve gasoline can should be always carried, stowed away in a locker for emergency use. Nothing is quite so exasperating as to be held up by an empty gas tank several miles out on the lake.

A waterproof rubber cover for the carbureter is a very useful device, especially in rainy weather. If your engine runs from a magneto keep it well protected from water in the same manner.

Where lubrication of the cylinder walls is accomplished by oil in the gasoline, the very best quality of air-cooled engine oil should be used, putting one pint in each five gallons of gasoline.

When launches or motor boats are used on small inland lakes or streams they are not required to observe the regulations in regard to equipment which applies to such boats when used on navigable streams or lakes. But it is better to have the equipment specified by the government regulations. Boats of twenty-six feet length or under must have one combination light showing white forward and red backward, one anchor light, a whistle, life preserver and a fire extinguisher. Boats larger than this are required to have two side lamps, one anchor lamp, and one bow lamp, one pair

screen boards, one whistle, one fog horn, one bell, one life preserver and one fire extinguisher.

An old automobile inner tube moderately inflated with air and enclosed in a canvas bag makes a good boat cushion, and is a life preserver as well.

Air reservoirs in small motor boats should be part of the regular equipment. It may be the means of saving not only lives but the boat.

In starting a two-cycle marine motor that is troublesome, first see that there is a good blue spark at the gap of the spark plug, then adjust the carbureter, beginning with a very scant amount of gasoline supply and gradually increasing until the proper power is obtained.

Irregular explosions are almost always due to irregular ignition current.

Get into the habit of giving two horn signals when you turn to the right and one when you turn to the left in meeting other boats.

If you run without lamps after dark and are run down and go to the bottom with your boat—don't mention it.

THE PRIZE CONTEST IN QUESTIONS AND ANSWERS

WHAT are you going to do for a table? This is a question that has bothered a great many motor boatmen. A table on a small cruiser is at best a sort of white elephant, and the smaller the boat the whiter the elephant, or rather the bigger the problem. In but few designs of this type of craft is provision made for a table and this is due probably to the fact that a permanent table, even though folding, is less desirable in boats of this type than a portable one. The cockpit is used as the dining saloon more frequently than the cabin and it is desirable, therefore, that the table be portable, besides capable of being folded, so as to occupy as little valuable space as possible. A number of good ones are described in the answers to the first question.

IN many cases the men that have built their own boats like to make their own equipment, and, while a little elaborate for the average amateur, the construction of a rear starter for a runabout is easily within the ability of the man with access to a machine shop. The second set of answers show how a number of amateurs have constructed practical devices of this kind.

THE last question answered in this issue is on the fuel problem, one of the biggest, if not actually the biggest, question that now confronts the owners of motor craft and the builders of engines. Abroad they are a little ahead of us in the solution of this problem, probably because the necessity has been greater, but we are waking up to the advantages of heavier fuels than gasoline, and in this connection the discussions in this issue are exceedingly interesting.

THE QUESTIONS FOR THE MAY CONTEST ARE THESE:

Describe, with drawings, the best method of constructing a

When You Send in Your Answers, state what you will take if you win a prize.

neat water-tight hatch for the motor compartment of a runabout.

Suggested by R. S. Donell, Detroit, Mich.

Discuss the dual vs. the double system of ignition.

Suggested by Capt. R. C. DeMary, Hancock, Mich.

What is the purpose of "storm oil" and how should it be carried and applied?

Suggested by W. E. Prior, Cleveland, Ohio.

ANSWERS to these questions, addressed to the Editor of *MoToR BoatinG*, 381 Fourth Ave., New York, must be: (a) In our hands on or before March 25, (b) not over 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 25th of March.

THE PRIZES ARE:

For each of the best answers to the questions above, any article advertised in *MoToR BoatinG*, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in *MoToR BoatinG*, which sells for more than that amount.

(There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.)

For each of the questions selected for use in the next contest, any article advertised in *MoToR BoatinG*, of which the advertised price does not exceed \$5, or a credit of \$5 on any article advertised in *MoToR BoatinG*, which sells for more than that amount.

For non-prize-winning answers published we will pay space rates.

How to Build a Portable Table.

A Very Important Part of the Equipment of the Cruising Motor Boat and One Frequently Overlooked by the Uninitiated.

THE PRIZE CONTEST—Answers to the First Question in the January Issue.

THE requirements which must be satisfied by a successful folding table on board a cruiser of moderate dimensions are as follows:

1. Ability to stand anywhere, usually between the transoms in the cabin or in such part of the cockpit as conditions of wind or sun may dictate.
2. Strength and rigidity when in use.
3. Compact folding qualities when not in use.
4. Shipshape appearance.

The ready-made, folding serving or card tables which are sometimes used on small pleasure craft for dining purposes, while they are strong enough to last for several seasons when not abused, and are generally very compact when closed, lack rigidity to an extent which renders them absolutely unfit for service afloat. Nothing is more annoying than to sit at a table which trembles violently whenever touched by knee or hand and which, owing to extreme lightness of construction, must be held in place whenever a passing steamer or launch causes a momentary rolling or pitching of the vessel. The saving of weight is of no consequence and the extreme of compactness when folded is not usually of vital importance.

Simple and Ship Shape.

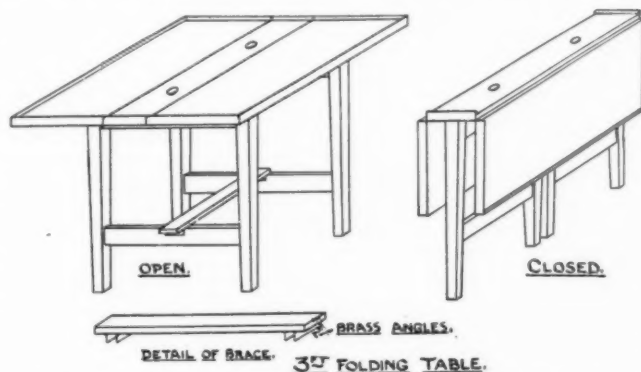
The Prize-Winning Answer.

The table described below was designed to give the maximum amount of comfort in use, together with great durability and sufficient compactness when closed to enable it to be fastened against a bulkhead without encroaching appreciably upon the valuable living space below. It is made of mahogany throughout, and owing to its design and weight will be found unusually rigid and stable. Rubber

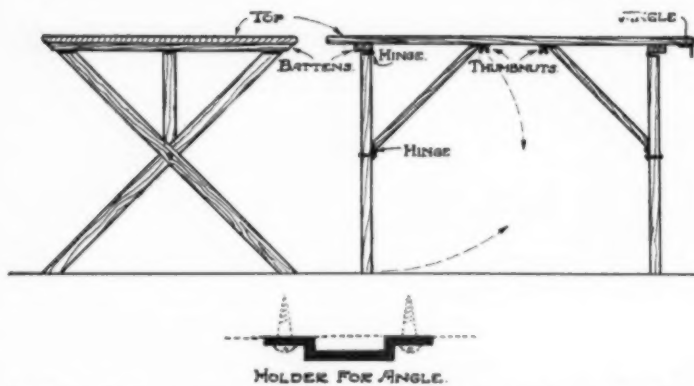
chair tips should be attached to the bottoms of the legs to prevent their slipping in a seaway and also to avoid scratching the floor in cockpit or cabin.

The top should be made of three pieces of selected, perfectly seasoned stock $\frac{3}{4}$ " in thickness, and when extended will measure 36" x 24". The width of 24" will be divided into a center strip 4" in width and two leaves hinging upon it each 10" wide. These side leaves drop down when the table is closed, making the total thickness including that of the leaves $5\frac{1}{2}$ ". Very substantial, securely fastened brass hinges should be used in connecting leaves and center section.

The legs, four in number, will be $1\frac{1}{2}$ " square at the top, tapering slightly at the bottom, and are framed together in pairs. The connection is made by two cross-pieces $3" \times \frac{7}{8}"$ mortised vertically into the legs, one at the top and the other 9" up from the bottom. The legs are 26" in length. Through the center of the center section of the table-top a $\frac{3}{8}"$ brass bolt with flat countersunk head passes down through the middle of the upper cross-piece of each pair of legs, being secured beneath by a nut with washer. The legs are thus free to turn crossways to or in line with the immovable middle



A table that is simple to build and easily folded. Note the rail to prevent dishes slipping off in a seaway.



L. R. Kelley's construction permits of a solid table of exceptionally light weight.

section of the top. When both pairs of legs are turned in line with the center section the leaves are allowed to drop down against them. When they are swung out at right angles with it they form a solid support underneath the raised leaves which cannot give way from any weight that can reasonably be placed upon them.

The legs are framed 14" apart and the bolts are spaced 19" between centers and 9" in from each end, thus affording sufficient clearness but no waste space.

When the table is set up, the work of but a moment, a flat piece of mahogany $\frac{3}{8}$ " x 2" having underneath at each end two pieces of flat brass projecting downward and spaced far enough apart to close down over the two lower cross pieces of the legs, is pushed down into place, preventing any possibility of the legs turning, and holding their lower ends rigidly in position.

When the table is folded for stowage it occupies a space $26\frac{1}{4}$ " x 36" x $5\frac{1}{2}$ ". A raised lip may be run around the edge if desired to prevent dishes, etc., from sliding off in bad weather. This should be about $\frac{5}{8}$ " in height and $\frac{1}{4}$ " in thickness with upper edges nicely rounded over.

There is nothing about the construction of this table to puzzle the amateur carpenter, and when completed it should prove a satisfactory piece of equipment on any cruiser up to 35 or 40 feet in length, and one capable of withstanding the hard usage inseparable from such service.

A. O. G., Portland, Me.

Light and Solid.

THE location of a table on board a cruiser will, of course, depend on the layout of the boat. If it has a large cockpit, this will be the most comfortable place for it in summer, but it should be so made that it will fit inside the cabin between the berths or some other convenient place when the weather is bad. A very convenient form of table is here shown, consisting of a top held from twisting and splitting by two battens screwed underneath.

The cross-legs are hinged to these battens, allowing them to swing up under the top for convenience in stowing and, by the way, the easiest place to stow it is up against the cabin roof—well for-

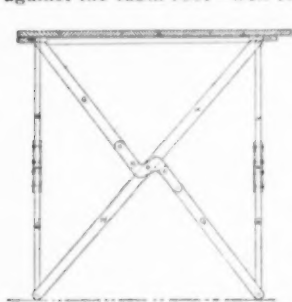


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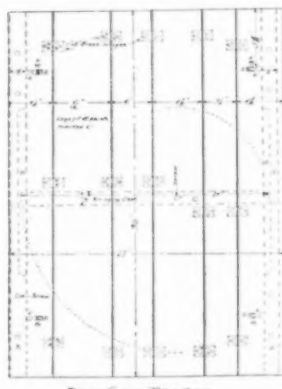
ward—held up by ropes or hook, upside down. The cross-legs have hinged to them a brace as shown, which has a plate with a hole in it screwed to its outer end. The hole fits onto a countersunk head machine screw put down through the top of the table and clamped there by a wing nut when the table is set up. These braces hold the legs firm. Both legs are used when in the cockpit, but the cabin size will probably not allow this when inside, and so only one end is set up; the other fastened up against the underside of the top. This supports one side of the table, the legs coming about in the center of the cabin floor; the other end is provided with short wrought-iron angles which fit into a slotted iron arrangement, permanently screwed to side of cabin. This allows walking around it, on one side, and at the same time a very firm table can be had.

The legs, battens and braces should be of oak, but the top can be of anything, either finished or covered.

L. R. KELLEY, Philadelphia, Pa.

Proved Practical.

THE folding table described herewith was designed some years ago to meet the requirements of a party of six to use on an extended cruise where accommodations were at a premium. Our object was to try and make one large enough to seat all hands at once, allowing plenty of elbow room for each person and at the same time have it so constructed that it would occupy the least possible space when not in use. After much discussion we agreed that each of us should submit a diagram or model of his ideas and the lucky one whose idea should be selected was to be relieved of the duty of mess-boy throughout the entire cruise as a prize. The sketch shows the one we unanimously selected, and I may state it suited our requirements perfectly. The big advantage in its favor was the fact that it could be set up in the cockpit where we could enjoy a meal out in the cool air in clear weather instead of sweltering in the stuffy cabin.



Top or Folding Table—Open

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so care should be taken that a fair balance is chosen between these two qualities.

Figures 1 and 2 represent a table open and closed, respectively, embodying such ideas. Open, it is 27" x 36" x 26½" high and closed, it occupies but 5" x 7", the top folding as indicated in figure 2 with the legs folded as shown in figures 3 and 4, fitting within the folded top. Complete, it weighs but 15 pounds.

Figure 5 shows a working drawing of the table top. It is made up of 6 pieces of ¼" oak, 36" long and each of a width as shown, fastened together by means of brass hinges. Pieces marked A and A' are of the same length and thickness, but 1½" wide and screwed to the underside of the top as indicated. These are gouged out slightly at B and B' to allow the swinging cleat, C, which is pivoted at C' to pass under and hold the table top flat open.

Four small blocks D, 1½" x ½" x ½", are screwed on the underside also as shown. Into D a small round-headed screw E is inserted. The legs fit into the space L, formed at the angle of D and A and the small wire F, figures 3 and 4, fits over E, holding the legs and table top firmly together.

The legs are made up of 12 pieces of 1" x ½" pine, 8 of which, G, figures 3 and 4, are 16½" long and 4 of which, H, are 35" long. The shorter pieces are connected together in groups of two by pieces cut out of 1/16" sheet brass and bored as shown in figure 6, either riveted or bolted to the two side faces of the shorter wooden pieces and pivoted by a brass bolt to the longer pieces at J. Eight legs are thus formed, which are connected together at the eight corners by means of fasteners made from sheet brass as shown in figure 7. A bolt or rivet is used, passing through the sides of the fasteners and the side faces of the legs, firmly holding them together and acting as a pivot for the legs to act on when opening and closing them.

Regular brass hooks and eyes may be used to hold the legs and top together instead of the brass wire and cleats shown at D, E and F.

The whole table should be given three coats of spar varnish.

A. ARMSTRONG, Norwich, Conn.

Supported on Two Stanchions.

THE question of Mr. J. L. Patton, coming as it does at this time of the year, is one suited to the needs of many embryo boat builders, and one that even veteran builders sometimes do not take into their consideration.

The drawing which accompanies this article will show perhaps a better idea of the construction of such a table than any printed instructions would give—a table which can be removed in a small space of time and yet is strong enough to bear any burden which it would possibly be subjected to.

Figure I represents the table top "A" and a brass or iron stanchion or railing support "B" into which the end of the 1½-inch brass or iron tube "C," Fig. II, is fitted.

In Fig. III the flooring of the boat or the deck, as the case may be, is a support similar to "B," except that whereas "B" is supposed to be fastened to the surface, the support "E" is intended to be counter-sunk in the surface.

In Fig. IV, "F" represents the keelson, in which a hole is drilled to correspond with the hole in the floor flange, and of a diameter and depth to take the lower end of the tubing "C."

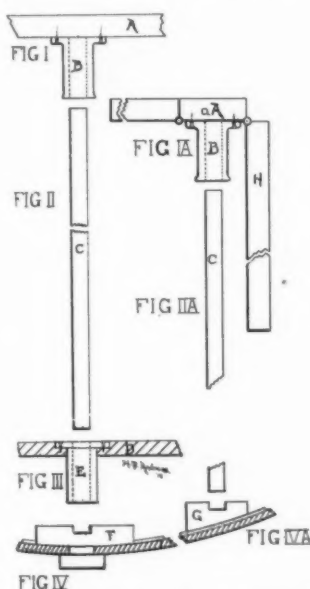
As the general height of tables is about thirty inches, the length of the tubing "C" will be thirty inches minus the thickness of the table top and plus the distance from the surface of the floor to the bottom of the hole in the keelson "F" or in the bed plate "G."

This measuring must be done wherever the table is to be placed in the cabin, on the deck or in the cockpit.

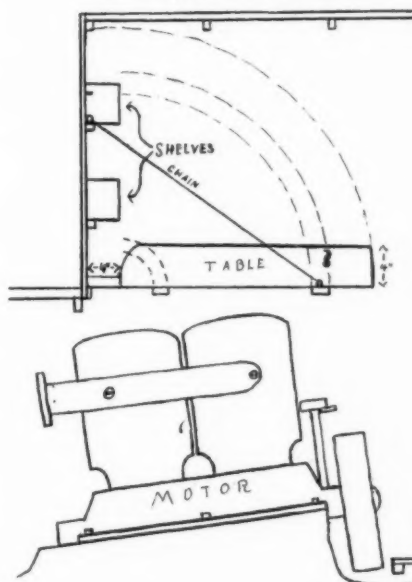
The figures I A showing a folding table top with "a, a'" as the center strips, and "H" as the leaves attached to this center strip by hinges,

a strip of wood one inch by two inches, and of a length to be four inches shorter than the total width of the table, is pivoted by a screw through the center of the edge to the center of the underside of "a, a'" to act as a support to the leaves "H" when the table is in use, if the table top is more than four feet long, two of these supports should be used.

Figure IV A shows the method of using the table other than the center of the boat, "G" being a bed-plate for the lower end of the tube "C."



M. D. Andrews' table is supported by two pipe stanchions.



The ingenious combination table and cupboard described by Blake Stevenson.

The table can be used in several places on the boat if care is taken that the tubes are the same length; the bed-plates under the different floor flanges can be spaced to bring the table to the proper height. In place of having one tube at each end of the table, as in the foregoing description, for a large table either in length or width, more tubes can be used as for a long, narrow table a tube can be placed in the center, from end to end; from three and a half to four feet is enough for a tube at each end to support—for every three feet more than this an extra tube should be used. In width three feet is plenty for one tube; any extra width needs the support of two tubes in the place of one, with the tubes about eighteen inches from the side of the table and five inches from the end, using two tubes in the center instead of one if the table is of extra length.

MELVIN D. ANDREWS, Canandaigua, N. Y.

Folds Against Bulkhead.

THE accompanying illustration with list of hardware should make it easy for anyone to construct a folding table. The size of the table depends largely upon the space in the galley, but a good-sized table is 24" x 18", but can be made large or smaller if the space over the motor is larger or smaller.

The table may be made of any kind of wood, but hardwood is far superior. The table is made of one-inch wood sawed to make a board of 24" x 18". Two pieces of wood 1" x 2" x 18" are screwed to the bottom of the table to make it fast. A coaming of ¼" oak nailed on three sides of the table (as shown in illustration) will keep things from rolling off when the boat is rolling.

In the illustration it will be noted that two shelves are shown; this may prove a very good place for them.

When the table is closed it shuts up close to the wall and is held there by two hooks and eyes.

List of fittings: 2 brass hinges, with screws (about 2½" long); 2 hooks and eyes; 2 brass chains, 2½" long each.

BLAKE STEVENSON, New York City.

The Simple Monolog.

WE are all familiar with the sort of table used in Pullman sleepers as a support for cards or a buffet luncheon. In response to our ring the obsequious Ethiopian extracts it from its hiding place, where its small compass permits it to rest in unobtrusive forgetfulness till called for, and quickly and easily sets it in place. This is done merely by the simple operation of straightening out the leg, which is set in the middle at one end and is hinged to the under side, and inserting the two curved brass lips or flanges at the other end in two slots in the wall of the car.

A table of this sort with one or two slight modifications is the simplest, handiest, and most compact type for use on the small cruiser. The leg does not need a spring catch, such as is used on the ordinary folding card table, for the weight of the table and the brass flanges at the side which hook into the slots will hold it in position in a seaway. The leg, however, should itself be hinged at such a point or points as to make its length alterable to conform with the height the table is desired above the floor.

Now, at the same heights above the floor as the length of the leg, the brass slots should be inserted in the ceiling or bulkheads of the boat. Window pulleys with the pulley-wheels removed are convenient for this purpose. Of course, they should be inserted at the same distance from each other as the brass flanges in the table end are from each other. The latter are simply pieces of sheet bronze about two inches wide and three inches long. One of the two-inch edges should be filed sharp and driven into the edge of the table; the other should be bent over so as to hold in the slot.

Slots should be placed in the forward bulkhead in cabin, or in the doorway leading from the main saloon into the forward compartment, if such is the style of your interior. The table will then be in place for people sitting on the extension berths or side seats. In the cockpit a higher elevation of the table is probably desirable and the leg should be extended its full length, while in the cabin the hinge in the leg should be used to make the surface lower.

In the cockpit the slots should be located on the bulkhead and in the coaming. By placing slots in the bulkhead near the wheel, one of the most important uses of the table may be had—that of chart table. The slots may be of polished brass and are not unsightly. When not in use the table with its leg folded takes up very little space and may be tucked away most anywhere, or held against the inside of a standing roof with straps. The size of table is wholly optional.

BRADFORD BURNHAM, New York City.

Constructing a Rear Starter.

A Necessary Device for the Runabout With Bulkhead Control—How it May Be Made by the Amateur Machinest.

THE PRIZE CONTEST—Answers to the Second Question in the January Issue.

Cast From Home-Made Patterns.

The Prize Winning Answer.

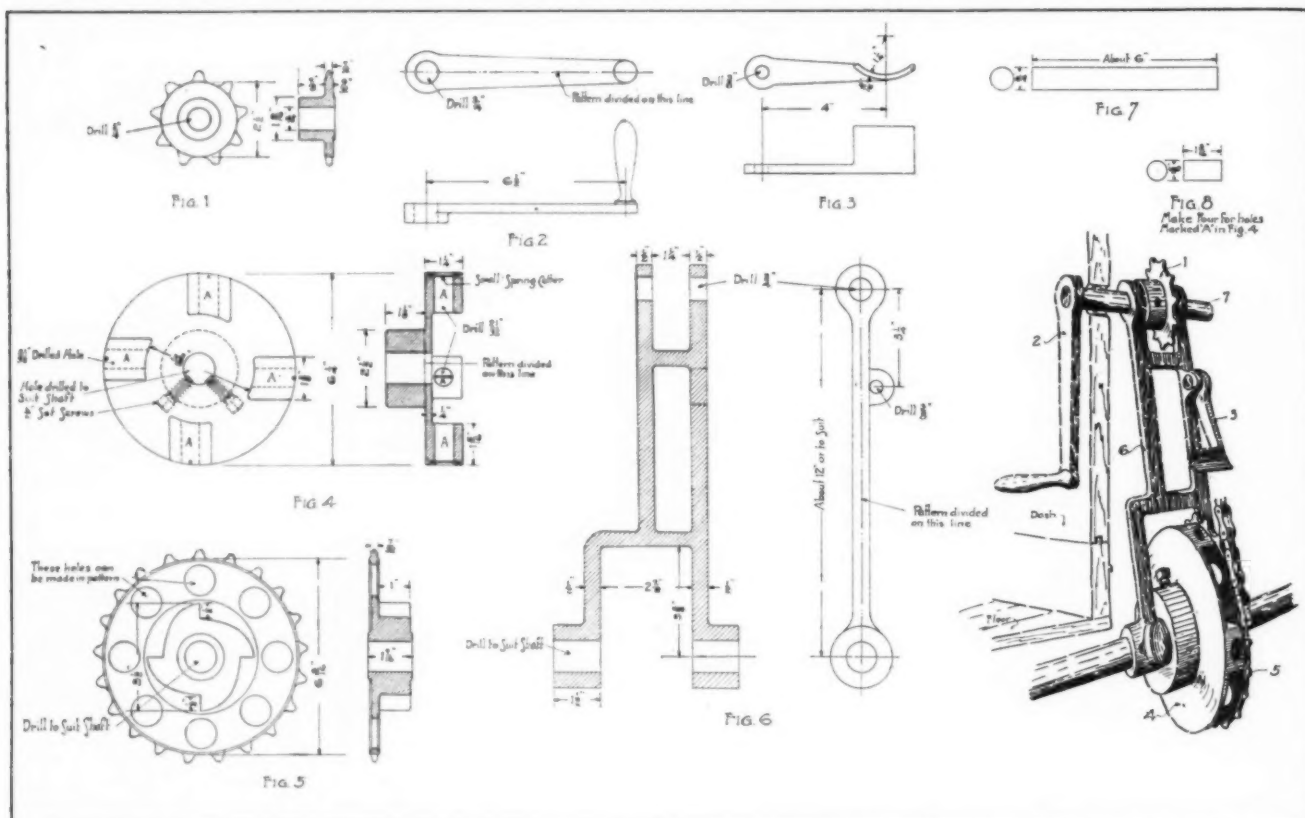
THE accompanying drawing shows a rear starter I built last spring and installed in my runabout. It worked well and gave me no trouble during the season. The cost was \$1.50 for castings, \$2.50 for machine work, 50 cents for a second-hand bicycle chain and 30 cents for a pair of grease cups; total, \$4.80. The patterns for the castings are made of pine, as shown on the drawings, only the holes are disregarded in the patterns, but are drilled in the castings later. Parts marked: "Pattern divided on this line" are two-piece patterns and should be fastened together with loose-fitting dowels. The hubs, etc., have a little taper on the outside, so the patterns can

the engine or propeller shaft by two one-half-inch set screws.

The pawl pins (Fig. 8) are wrought iron, and must work easily in the holes "A" in the spider as they are held out by the centrifugal force and drop down when the engine is stopped. They then engage with the ratchet on the large sprocket (Fig. 5).

A wooden or wrought-iron support may be fastened to the forward end of the short shaft (Fig. 7), but is not wholly necessary. It might be well to add that the centers of holes "A" are not drilled towards the center of the shaft, but the edges of the holes should line with the center of the shaft. The starter can be installed to suit a right or left-hand engine. A couple of coats of iron paint or enamel will take away the home-made appearance of the affair. My starter is used on a 14 h.p. double-cylinder engine, and I feel confident that it

A pin should be driven into the sprocket to keep the pawl from rubbing on the chain, as shown in the sketch. The ratchet is easily made from a piece of soft steel, turned to two diameters, larger diameter for teeth and $\frac{1}{4}$ inch smaller diameter for hub. The teeth should be laid out on the larger end about 1 inch apart. Saw a slit with a hack saw on the face line of each tooth to the depth required and back off the teeth with a file. The upper sprocket and crank are shown pinned to a short $\frac{3}{4}$ -inch shaft. The lengths of the shaft will of course vary with the different bulkhead arrangements. In some cases an extra bearing will be necessary. The bearing shown is of brass polished on the crank end. A hole is bored in the bulkhead to receive it, and is also held in place by brass screws. A piece of $\frac{1}{4}$ -inch x $1\frac{1}{4}$ -inch flat iron is bent around the sprocket end of the bearing, the ends being



M. A. Wright's drawings for the details of his rear starter, shown assembled at the right. The collar, Fig. 4, is secured to the shaft by means of set screws. The receptacles, A, contain the pawls, which engage the ratchet on the sprocket wheel, Fig. 5, until the engine is started, when they are held away by centrifugal force.

be drawn out of the sand. It is best to buy the bicycle chain before making the patterns and fit the teeth on the sprockets to the chain. Bicycle chain is made in two sizes, one-quarter and three-sixteenths inch. I used the larger of the two, as it is stronger. After the patterns are down to shape, sandpaper them off smooth and paint black, afterwards give them a few coats of shellac.

Your patterns are then ready for the foundry. After receiving the castings from the foundry, file down the rough places and see that the chain will fit on the teeth, then with a pair of dividers and a center punch lay out the holes for drilling. If you are careful in making the patterns and laying out the holes, the machine work, excepting the tapping, can be done on the drill press. The crank and small sprocket are pinned to the short shaft (Fig. 7) with three-sixteenth-inch iron pins.

The spider (Fig. 4) is securely fastened to

would start two such engines at once.

M. A. WRIGHT, So. St. Paul, Minn.

Permits Reversing Engine on Spark.

A PRACTICAL and simple rear starter that has given me a good deal of satisfaction is made as shown in the sketch. Two bicycle sprockets and a chain are used, and I have found these strong enough for a two-cylinder, 8 h.p. engine.

The sprockets are about 5 inches diameter, with a cast-iron hub pressed into each. The lower sprocket is loose on the shaft and has a pawl mounted on a stud on it, and this pawl drops into the teeth of a ratchet when the sprocket is revolved, the ratchet being keyed or pinned to the shaft.

securely fastened to cleats on the ribs. The brace is also drawn tight around the bearing by means of the bolt shown. This braces the sprocket end of the bearing and keeps the chain from getting slack when the engine is cranked. The crank shown is a polished brass auto crank. The crank bearing can be located on either side as well as in center of the bulkhead. To start the engine, turn the crank about one-quarter turn in either direction and the pawl drops into the ratchet teeth, then crank. When the engine starts, the pawl is forced out from the teeth, leaving the sprocket chain and crank stationary. When the crank handle drops down the pawl drops down, therefore the engine may be reversed by means of the spark and not engage the starter. This device is easily made, and will give good service and crank easily if made as described and shown in the sketch.

GEORGE SORENSON, Rockford, Ill.

Shaft to Forward End.

A PRACTICAL and simple rear starter to be operated from the bulkhead and at the same time be of such construction as to alleviate the chance of injury to the operator through back-fire has been sorely needed for a long time.

I have fitted my speed boat Dauntless, which is powered with a six-cylinder, fifty horsepower Milwaukee motor, with one of these simple, safe and very effective starters. This device consists of a twenty-six-tooth ratchet sprocket wheel on end of engine shaft, connected by means of a steel chain to an eighteen-tooth sprocket wheel on a one-inch shaft, which is placed on one side, and as high up as the deck will permit. This shaft is supported in a small bearing in the forward end, and a small bearing supported by the bulkhead carries the cockpit end of the shaft. Upon the end of shaft extending into the cockpit is placed an ordinary wood-rim handwheel of 14-inch diameter.

The forward journal box can be supported by a diagonal piece of wood extending from the upper planking and deck ribbing down to the keel. This is all that is necessary, and it makes a perfectly safe and simple starter, one that is safe and easy for a lady to handle. It can be operated from the forward or driver's seat in the cockpit.

In case of back-fire this wheel merely slides through the hands and does no harm. Anyone having started gasoline motors with a crank will readily appreciate this style of starter. The cost of the starter which I have just mentioned, including the installation of same, was less than twenty dollars. The apparatus would be cheap if it cost five times the amount of the actual cost, on account of obviating the danger of using a lever or crank directly on the engine shaft or otherwise, and in addition the device, when installed, makes a very neat and trim appearance.

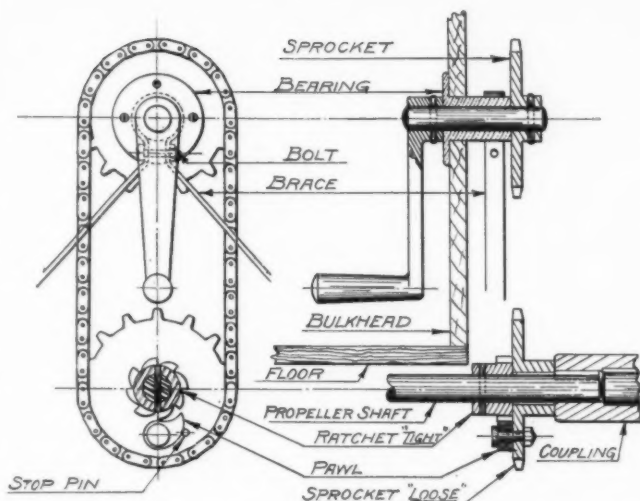
I have equipped two other boats with this device, and in each instance it has proven to be just what has been needed. It has transformed the agony of starting a gasoline engine to a pleasure.

WM. GLADER, Chicago, Illinois.

Uses Belt and Pulley.

THIS device for starting the engine from the bulkhead of a runabout involves the minimum of the machine work, which is usually a stumbling block to the practical man. The arrangement works on the well-known principle that, to receive or transmit power to or from a pulley, the slack side of the belt must be under a certain amount of tension. The modern automobile brake employs successfully this principle.

Referring to the drawing, it will be seen that an 8-inch pulley is keyed to the shaft between the motor and the reverse gear; around this pulley is placed a 2 or 2½-inch, single-thickness, water-proofed belt, one end of which is fastened with copper rivets and burrs to the lug on the starting lever; the other end is fastened in a like manner to the spring lever, which maintains a tension, by means of a stiff coiled spring, on the slack side of the belt when the starting lever is



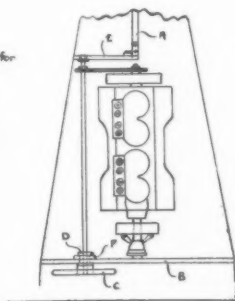
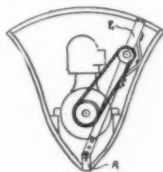
When the crank of Mr. Sorenson's starter is down, the pawl falls out of contact with the ratchet and the engine may be reversed by means of the spark.

pulled up.

Should the engine start during or at the end of the pull on the starting handle, that side of the belt attached to same immediately becomes slack, owing to the direction of rotation of the pulley. This disconnects the starting gear from the motor immediately.

Should the engine back-fire, the starting handle is merely pulled from the hand of the operator, returning to its original position with-

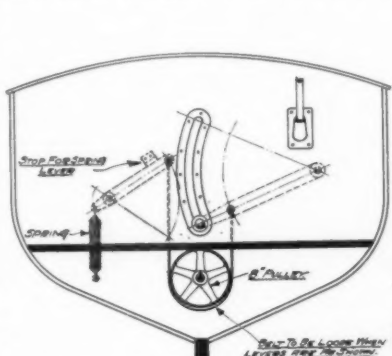
- A. Keel
- B. Bulkhead
- C. Handwheel
- D. Self-collaring
- E. Brace
- F. Reinforcement brace for bulkhead



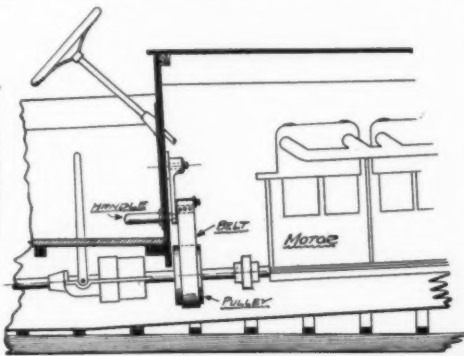
William Glader runs a shaft from the bulkhead to the forward end of the motor.

out injury to the same. Care should be taken in placing the spring lever stop so that the belt is loose when the starting arrangement is at rest. This disconnects it entirely if engine should back-fire or run backward in starting.

Sizes of pulleys, levers, etc., will, of course, vary with different size engines. The drawing, as shown, shows an 8-inch diameter pulley with levers designed for 10-inch linear pull on the belt, which will give over one-third revolution to the crank shaft, sufficient to start even a single-cylinder motor. The levers are forged black iron, and drilling and riveting the handle and belt lugs will be done cheaply by



W. E. Motz's ingenious arrangement for turning the motor over by means of a belt and pulley.



any good blacksmith. A slotted iron or brass plate should be fastened to bulkhead for finish and for the handle to work in same. A slot or other guide on the handle which engages this plate will steady the handle end of the starting lever if necessary.

This arrangement does not interfere with engine controls, steering gear or the usual bulkhead equipment.

W. E. Motz, Philadelphia, Pa.

Circular Belt and Idler.

THE illustration shows a very simple and easily made rear starter which will answer all purposes for the ordinary motor boat.

Shaft "A" is the same size as the one furnished with the motor, and is equipped with the same ratchet arrangement that the starting end of the engine shaft has so that the same crank, "G," can be used on either place. This crank was the one furnished with the engine.

Shaft "B" is forged into a U shape, and has a square outer end, to which another crank "H" is fitted. Both of these shafts run in brass tubes as bearings, forced into holes made in the bulkhead "L" and the plank "M," which is securely fastened 3½ inches from the bulkhead.

A wood pulley, "F," 10 inches diameter by 3 inches face is keyed to the engine shaft "C." A flanged idler pulley "E," 3½ inches diameter by 2½ inches face, runs loose on shaft "B," and another wooden flanged pulley "D," 4 inches diameter by 2½ inches face, is keyed to shaft "A."

The slot "K" in plank "M" allows the pulley end of shaft "B" to move in it. A 2-inch belt, single thick "J," of sufficient length that it will not touch pulley "F" when the idler "E" does not touch the belt, is required.

Starting of engine is accomplished by pulling up on crank "H," which tightens the belt so that when crank "G" is moved, it will turn the engine over. If she starts, the ratchet slips the crank off, as it does when the engine is started in the usual way. If she back-fires, dropping crank "H" will immediately loosen the belt, stopping the pulley "D" and its crank. By this means no parts are moving unless the idler "E" is moved to tighten the belt.

L. R. KELLEY, Philadelphia, Pa.

A Practical Starter.

WITH an arrangement as shown in drawing A, with engine and reverse gear connected by means of couplings, a rear starter operated with a steering wheel sprocket and chain is quite simple and very efficient. If the reverse gear and engine are complete in one base, the apparatus may be used with even slightly better results behind the flywheel and supported by the front bearing.

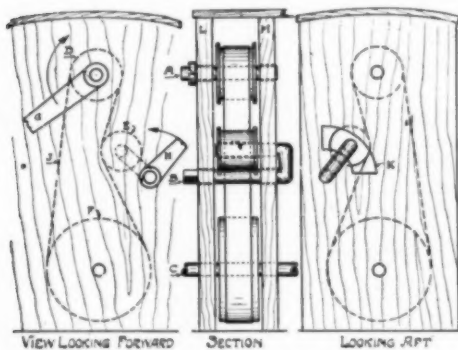
The detail of starter is shown in drawing B. No. 1 is the half coupling as in drawing A, but if used behind the flywheel, the outside of the front bearing must be turned to act as a bearing for the starter, the advantage being that the starter does not turn on the bearing when the engine is running, but only when turned over by hand.

The coupling 1 must be turned and faced to support the sprocket 2 and ratchet 3, the sprocket and ratchet being securely fastened together by means of flat-head machine screws. No. 5 is a round disc, 7 inches in diameter, with five (5) projections, 1 1/16 inch x 15-16 inch, equally spaced and drilled to receive a piece of 1/2-inch cold-rolled steel, 13-16 inch long with 1-32 inch clearance. A 1/4-inch hole should be drilled the rest of the way to prevent air cushioning when the piece of steel No. 4 is thrown back by the centrifugal force as the machine starts. The disc 5 is fastened to the coupling with three 1/4-inch round pins, as shown (if used behind the flywheel, this disc should be fastened to the flywheel). Good results are obtained by using a 6 1/2-inch, 20-toothed sprocket on the starter and a 3 1/4-inch, 10-toothed sprocket on the wheel shaft.

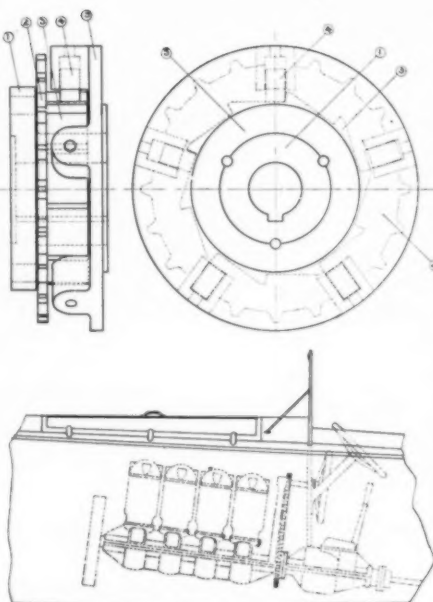
The apparatus is absolutely noiseless in operation, as the 1/2-inch steel pins are held away from the ratchet while the engine is running and drop into place as soon as the machine stops.

J. M. M., Brockville, Ont., Canada.

The apparatus in detail and applied to the shaft is shown to the right.



L. R. Kelley employs a continuous belt with an idler to produce the tension necessary to prevent slipping.



In J. M. M.'s device, the pawls are held away from the ratchet by centrifugal force when the engine is running.

Lever and Ratchet

IF simplicity is the thing most desired, the following ought to satisfy, and yet it is perfectly practical.

Make a pattern for a cast-iron disk, with ratchet teeth cut on the outside (see A), a little larger in diameter than the coupling B; bore a hole in the center 1-16 inch larger than the small part of the coupling C; take the bolts out of the coupling and put on the disk; bolt securely, using countersunk heads on the ratchet side. Get a blacksmith to make lever D, 14 or 16 inches long, with heel to fit on

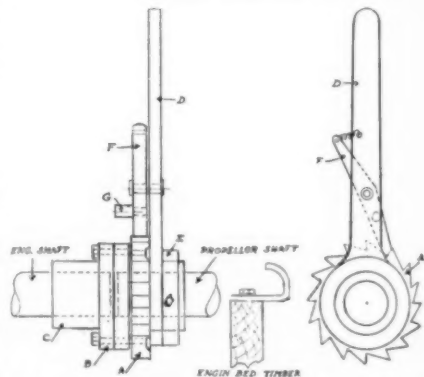
coupling next to ratchet. Slip a collar E next to it, and fasten same to shaft with setscrew, to hold lever up to ratchet.

Fasten pawl F on lever as shown, riveting a stout pin, G, on same. This pin is to throw the pawl out of engagement if the motor should backfire, also to hold it out when not in use.

On the engine timber put a piece of flat iron, H, 1/2 inch x 1 inch, and bend it so that the pin G will catch it when it comes over. When not in use the lever will lie on the engine timber with pawl disengaged.

If the motor backfires, the lever will be thrown around till the pawl F hits H, when it will be disengaged. The momentum will carry the lever on till it strikes the engine timber, where a rubber bumper might be placed. There is very little chance of injury in this, as the face is above the lever and the legs ought not to be in the way. As an extra precaution, drill a 1/4-inch hole in H, slip a rod through it and fasten the other end to the timer, so that when the spark is advanced, the end will protrude through H, interfering with lever D when it is lifted up, this drawing attention to the fact that the spark is not retarded.

JOSEPH APPLETON, Moline, Ill.



The simple lever and ratchet of Joseph Appleton.

Kerosene vs. Gasoline.

All Phases of the Fuel Question, One of the Motor Boatman's Most Vital Considerations, Discussed by the Readers of MoToR B atinG.

THE PRIZE CONTEST—Answers to the Third Question in the January Issue.

THESE substances are hydrocarbons of the paraffin or methane series, having their origin in coal oil or petroleum. They are the result of fractional distillation; that is, distillation at fixed temperatures until all of each body of the same atomic weight, specific gravity, etc., has been secured. Increasing the temperature will cause bodies of greater density to volatilize, which, when condensed and examined, will be found to have different properties.

From the very nature of their origin, we would expect them to possess many features in common, which investigation has shown to be true. They are agents for the production of work by means of special mechanical devices. In producing this result they demonstrate their common relationship through (1) thermic efficiency or relative number of convertible heat units per gallon, (2) volatility, or ease of vaporization for mixture with air, (3) facility with which mixtures will ignite, (4) rapidity of combustion, (5) products of combustion, (6) cost of raw material, (7) relative danger in the use of each.

Kerosene contains a greater number of heat units than gasoline. This is the assertion of several authorities whose opinions are entitled to respect. In common parlance, then, a gallon of kerosene can do more work than a like quantity of gasoline, all things being equal. Now, to secure this equality is the problem, for at the outset we encounter one of the great-

The Advantages of Both.

The Prize Winning Answer.

est stumbling blocks, i. e., volatility.

That gasoline holds the first place as regards volatility no one would think of denying. The very simplicity of the devices for the production of a mixture with air points to this fact clearly. On the other hand, kerosene requires heat. Even when perfect volatilization of kerosene and proper admixture with air is attained, certain things are necessary to equalize the two gases. Again, the comparative ease with which gasoline is vaporized naturally indicates that we are dealing with a gas of great rapidity of combustion. When compared with a kerosene mixture this is true, for a measurable difference in time occurs between the beginning and completion of combustion of a given volume of each gas. Consequently, we are on a basis of inequality somewhere, if our claim as to thermic efficiency be true. We are therefore compelled to give consideration to the devices for using these gases and to point out their differences and the significance of each.

If the modern internal combustion motor, as used for gasoline, be used for the consumption of kerosene vapor, a falling off of power results, because the slower burning gas does not impart to the piston heads the intense impact exerted by the more rapidly combustible gasoline. Consequently, the initial loss of power is not, nor cannot be, overcome, even though

the more slowly burning kerosene continues its expansion for a greater period of time. In other words, gasoline exerts its violent influence at one fell stroke, while kerosene continues to expand during the greater portion of the stroke in a gentler manner. Then again there is not the same number of heat units in a given volume of kerosene vapor, because more air is required for proper dilution of the gas. By a greater degree of compression of the cylinder contents—to a degree impossible with gasoline—we begin to approach the ideal condition for kerosene, and as great, if not greater, work per gallon of fuel results, the motor working with extreme smoothness because of this slower "explosion."

Still other difficulties exist, which must be entirely removed before kerosene can entirely replace gasoline in the marine field. I refer to ignition. On the larger types of engines as seen in working boats and a few large cruisers, a hot ball or similar device is used to ignite the charges.

To overcome this, devices are being perfected whereby kerosene injected around a hot exhaust pipe is vaporized and aerated and fired after compression by the ordinary high-tension spark. To secure this hot exhaust, the motor is started on gasoline, and when conditions are right, changes over to the heavier oil; the objection to this being that two tanks are necessary to safeguard, and if this motor be of high-compression type, it is apt to have

premature explosions during the time gasoline is in use.

As to the products of combustion, carbon, smoke, smell, etc., these are small and insignificant factors in the problem. Properly proportioned mixtures will not result in carbon deposits. The smoke problem can be easily disposed of by proper mixture, lubrication and some form of submerged exhaust. As for smell, I think gasoline no more aromatic than kerosene, whether burned or unburned, while its fumes are very disagreeable when inhaled.

The cost of kerosene makes it at once the desirable fuel. Where large powers are concerned there must result a large cash saving in a long day's run, so that the inconvenience of a small time loss cannot begin to weigh against the cash saving. At present it is somewhat difficult to be had, but demand will soon settle that S. O., while disbanded, will be found to be very much "on the job."

By its nature, gasoline is the more dangerous, but the percentage of accidents as compared to the amount used is ridiculously small.

In resumé, we can award kerosene (1) thermic efficiency, (2) cost, (3) safety, and against it place difficulty in handling (a thing rapidly disappearing); and for gasoline, (1) ease in handling, (2) slightly lesser efficiency, while against it are (1) high cost, (2) danger, (3) gradually increasing inferiority.

L. H. PRINCE, Philadelphia, Pa.

The Ideal Fuel.

IN discussing the relative merits of gasoline vs. kerosene for use in internal combustion engines, we must first learn what constitutes an ideal fuel.

Design and heat are the resources of the manufacturers of carbureters. Engine builders must discriminate between carbureter efficiency and fuel efficiency. A carbureter poorly designed will condemn a fuel of the highest class.

Drawing a line between carbureter efficiency in delivering fuel and fuel efficiency in the engine cylinders, let us take up the latter and we will come nearer to knowing what is desired in a fuel for internal combustion engines.

1. Cheapness.
2. Greatest calorific value.
3. Quickest and most complete combustibility under wide range of temperatures.
4. A fuel free from acidity, moisture and sulphur compounds.

From the foregoing we reach the conclusion that the fuel most desired embraces the greatest calorific value with the lowest volume and the lowest cost per gallon.

What is gasoline? It is simply a trade name which came into use forty years ago as a title to cover the lighter fractions distilled from crude petroleum. It may represent anything from 85 gravity to 58.

Let us glance at the following table:

Fuel.	Specific Gravity Baume.	Cal. Value Per Pound.	Weight Per Gal.	Cal. Value Per Gal. B. T. U.'s.	Average Car Load Price Per Gal.
Gasoline	85	19,000	5.42	102,000	\$0.22
"	74	19,000	5.68	107,000	.16
"	64	19,100	5.85	111,000	.11
Naphtha	58	19,100	6.20	116,820	.08¾
"	52	19,200	6.50	123,200	.07
Kerosene	46	19,250	6.65	124,550	.04

The light weight distillates are the highest priced. The heat values are nearly constant pound for pound, but gallon for gallon there is a vast difference. The statement is universally made that it is very difficult, if not impossible, to start an engine on kerosene. If this is the case the fault is clearly with the carbureter in not delivering a proper mixture into the cylinders.

Volatility is necessary because the present-day marine and automobile engine demands it, for operating cars and boats, which are unheated, in temperatures from 30 degrees to nearly zero.

Of course it is a well-known fact that the volatility of either gasoline or kerosene increases or decreases with the rise and fall in

temperature. One important factor which must not be overlooked is the fact that both fuels carry many impurities, and if the combustion is imperfect, large deposits of carbon will be formed on cylinder walls and igniters.

In many localities it is impossible to secure gasoline, or if so its price is prohibitive. Kerosene may be purchased in practically all parts of the world and at a comparatively low cost. The safety with which it may be handled is also another prime factor.

In comparing the merits of the two fuels we reach the following: In gasoline we have a fuel which is expensive, dangerous, comparatively low in calorific value, yet a fuel easily vaporized at low temperatures.

In kerosene we have a fuel low in price, practically no danger in handling, of high calorific value, but low volatility.

There can be no question but what kerosene is the ideal fuel, but to take advantage of its merits we must have carbureters designed to utilize it in an efficient manner.

CAPT. R. C. DEMARY, Hancock, Mich.

Favors Gasoline.

WITH motors at their present state of development the best fuel is gasoline.

Unless the motor boatman lives in Timbuctoo or Thibet, or some other equally interesting place, and is dependent upon the five-gallon tin of case oil, furnished by the "only and original reasonable trust," for his fuel supply, he should use gasoline.

The motor boatmen of the Pacific Coast have an enormous supply of fuel oil near at hand, and it is used to a great extent in the commercial side of motor boating, but when they get in a hurry or go for pleasure they use gasoline.

On the Atlantic coast everything is in favor of gasoline, from Eastport to Key West. At almost every town on the coast a boat can be supplied with gasoline with less delay than with kerosene. Special facilities are nearly always provided for supplying gasoline, while kerosene has to be pumped from barrels or comes in five-gallon cans. This does not make much difference to the man buying ten gallons, but the man in a hurry, who has to take two or three hundred gallons aboard in this way, will be more than out of patience before he is half done.

Granted that kerosene is cheaper per gallon than gasoline, it does not follow that it is cheaper per mile. The average motor which will burn either fuel develops about twenty per cent. less power on kerosene than gasoline. Less power means less speed, and if the time of the owner and guests is limited, the difference in fuel cost is not to be considered.

The first cost of a power plant for burning kerosene is greater than that for gasoline, a good kerosene motor sometimes costing nearly double the price of a gasoline motor of equal power. The kerosene motors are necessarily heavy and slow-turning machines, and are hardly suitable for pleasure craft.

Gasoline, if spilled, evaporates and leaves no smell, while kerosene leaves a grease spot and smells, apparently forever, if spilled anywhere in the boat. A gasoline motor in a small cruiser is pretty hard to live with in rough weather. A kerosene motor is much worse—very much worse, to put it politely—and a motor in action burning kerosene smells like a dirty lamp at 3 a.m. multiplied to the n'th power. The claim of greater safety for kerosene is probably true, but care is necessary with either fuel, and with proper care either is safe.

The technical side of the question is interesting, but really counts for little in practice. What good does it do to know the difference in thermal units in a gallon of each, if your motor won't start without about an hour's preliminary manipulation, and there is small satisfaction in the thought that one has saved ten cents if it takes an hour longer to make your trip.

Mechanical simplicity is all in favor of gaso-

line, especially if the motor has to be started on gasoline and then switched to kerosene, which adds a double system of tanks and piping.

To condense, gasoline is handier, cleaner, simpler and more powerful. Kerosene is slightly cheaper. Is gasoline not the best?

PORTER G. PIERPONT, Savannah, Ga.

The Fuel of Tomorrow.

FROM the time of Adam, necessity has always been the mother of invention.

And the optimistic point about it has been that the new invention has generally been far superior to what it replaced. Our grandfathers got terribly stirred up when whales began to get scarce, and they faced the awful possibility of a world without whale oil. But necessity promptly supplied another and a far better illuminant in the shape of kerosene.

A similar crisis is now before us. For several years the ratio of supply and demand as regards gasoline has been rapidly widening. When gasoline was only useful for cleaning my lady's white gloves and for similar purposes, it could hardly be given away. But now there are in the United States alone something like 1,500,000 gasoline engines—stationary, automobile, marine and aerial—with an annual increase of not far from 500,000. To meet this enormous increase in demand, the supply has been woefully deficient. A steady reduction in the grade sold (76 Baume is now a golden dream outside the apothecary's) has failed to stem the tide. The time is ripe for necessity to bring forward her substitute.

She is ready. In 1906 there were taken from the earth of the United States 126,493,936 bbls. of crude petroleum. In its refinement, for every pint of kerosene obtained, only a small fraction of that amount of gasoline is given off as a distillate. The supply of kerosene is therefore bound to be always far greater than that of gasoline, and the above figures show it to be a continued sufficiency. Now, as to its fitness as a substitute:

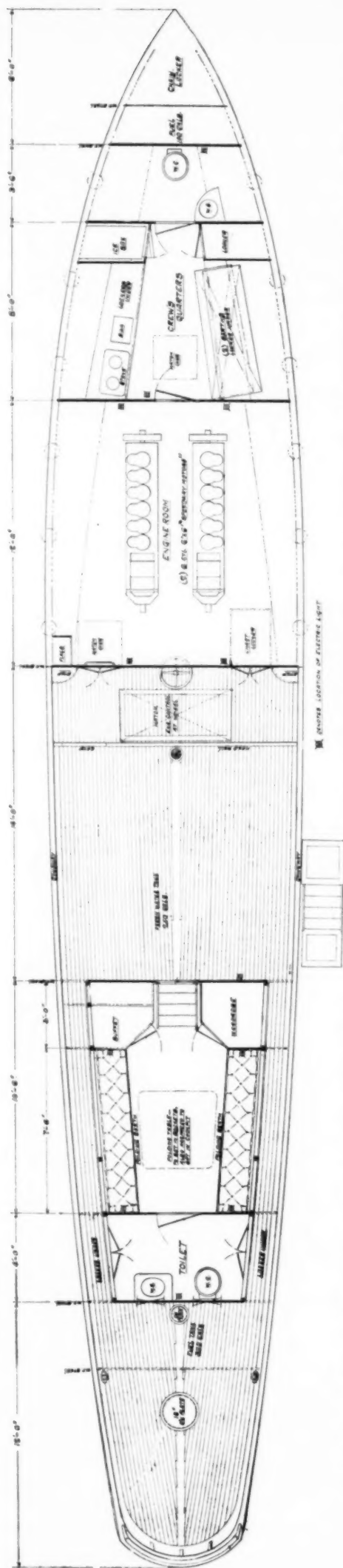
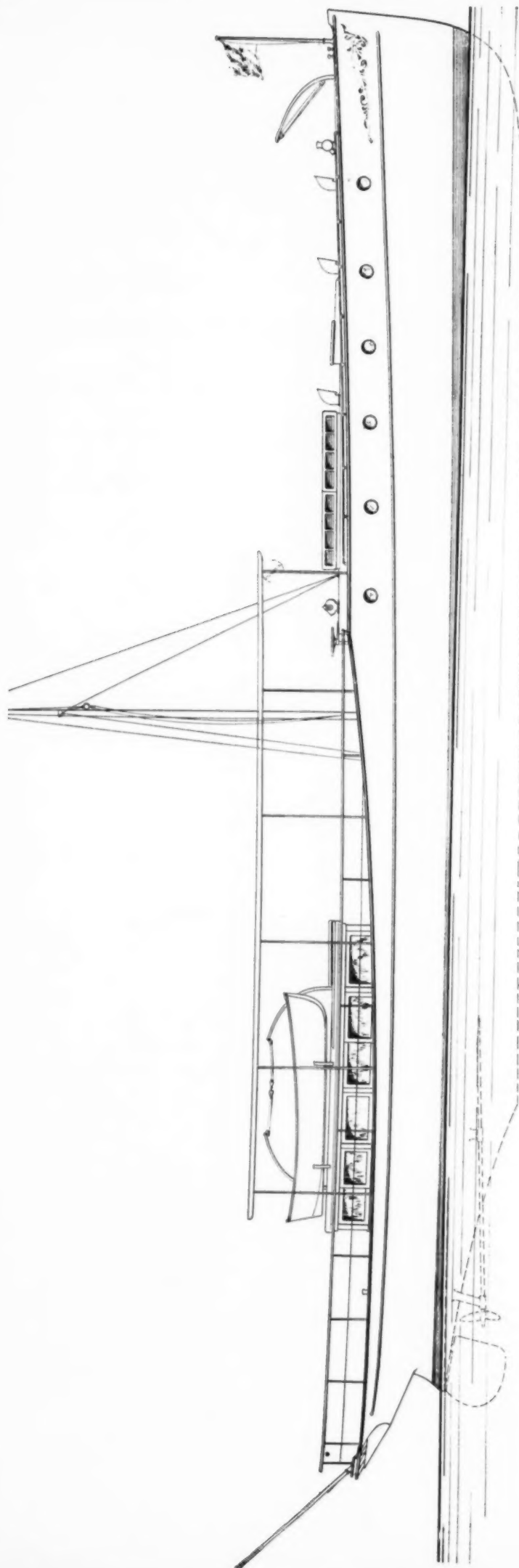
In considering what is the best fuel for the internal combustion engine three factors stand out as most important. They are, *a*, economy; *b*, efficiency, and *c*, safety. Let us compare kerosene with gasoline in these particulars.

(*a*) Since the supply of kerosene is bound to be always far more abundant than gasoline, that it will also always be cheaper, whether at wholesale or retail, is obvious. Moreover, it has been steadily decreasing in price, while its offspring, gasoline, has been soaring. It may now be bought in this country for 5 cents a gallon. In the Philippines it is 20 cents, while gasoline is \$1.00. It is safe to assume that the price of kerosene will remain less than one-half that of gasoline. In addition, it is more powerful, pint for pint, than gasoline, and so the fuel consumption per horsepower would be less; which brings us to our second point, efficiency.

(*b*) Two obstacles have opposed the progress of kerosene as fuel for the internal combustion engine—the difficulty of obtaining proper vaporization and the difficulty of obtaining perfect combustion. It is here that necessity has produced the invention. Converters or appliances for removing these difficulties are already on the market, and will soon be in general use. With perfect combustion comes an odorless and colorless exhaust—with proper lubrication, of course. Have you ever seen such an exhaust in a gasoline motor?

(*c*) Though more powerful when confined than gasoline, kerosene, with its much higher flash point, is far less inflammable and dangerous than gasoline. Insurance regulations quickly substantiate that. And with kerosene for fuel, that gravest of motor-boat dangers—a gasoline-covered bilge—vanishes, for the cigar butt may be thrown into the bilge with impunity. Did you know that cold, liquid kerosene when uncombined with air, as in the wick, cannot be ignited with the match? You don't believe it? Pour some out on the sidewalk and try it!

BRADFORD BURNHAM, N. Y. City.



This 70-foot craft for the commodore of the Larchmont Yacht Club is one of the most interesting now under construction. She is provided with six watertight steel bulkheads and her twin screws will drive her at a speed of 14½ miles per hour.



NEW MOTOR BOAT DESIGNS



THE boat whose design is shown upon page 40 is being built at the works of the Gas

A Twin Screw Yacht.

Engine & Power Co. and Chas. L. Seabury & Co., Consolidated, Morris Heights, New York City, for Commodore George N. Pynchon, of the Larchmont Yacht Club, from the plans of Chas. L. Seabury. She is 70 feet, 3 inches in length over all and measures 65 feet at the load water line, with a beam of 11 feet, 6 inches, and a draft of 3 feet, 6 inches. The guaranteed speed is 14½ miles per hour, which with her powerful motors, should be attained with ease. This type represents a particularly seaworthy vessel and her owner expects to use her principally in connection with his racing sloop, Istalena. She will make a most comfortable craft for this purpose and she will be capable of taking extended trips.

The crew's quarters are located forward and in same compartment, upon the port side, is a galley for the use of the crew. This compartment provides space for two berths with lockers underneath.

Aft of the crew's quarters is the engine room, which contains, aside from the motors, plenty of locker space. The power equipment consists of two 6-cylinder, 6 x 6-inch Speedway motors, which will drive the vessel at good speed without vibration. The motor room, as well as the crew's quarters, is lighted

by port holes in addition to a skylight over the motor room. The question of ventilation, in the forward part of the vessel in particular, has been well worked out and light and air are supplied in abundance.

Aft of the motor room, and communicating with it through a modified companionway, is what might be called the bridge deck, from which the vessel is controlled. The wheel is of the vertical type and a binnacle rests upon the after part of the raised deck space over the engine room. A hand rail provided with a gate separates this bridge deck from the main midship section, which is left as open deck space, and aft of this a companionway leads down into the main cabin, which is of trunk design. This deck is 14 feet long and extends the full width of the vessel.

The saloon contains folding berths, a buffet and a wardrobe, and a folding table is arranged to set either in sockets in this compartment or else in the cockpit. At the end of this saloon is a large toilet room, extending the full width of the trunk cabin.

Additional deck space is provided aft of the saloon and the whole free portion of the vessel is left unobstructed for passageway and chair space. A canopy covers the trunk-cabin

section and the bridge deck, affording full protection.

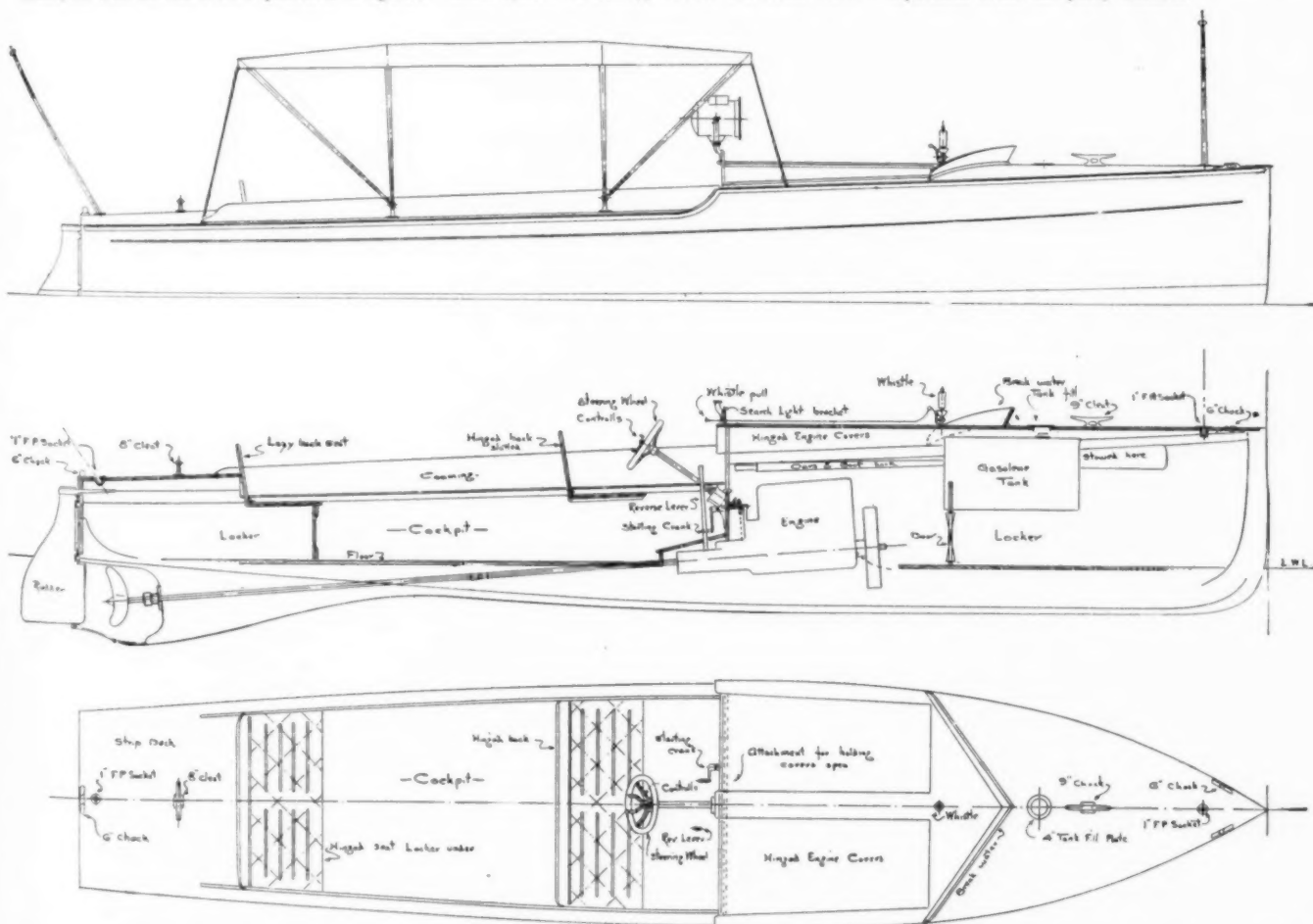
The fuel is divided, a 100-gallon tank being provided at the forward part of the vessel and a 300-gallon tank aft of the saloon. Fresh water tanks are provided under the midship deck section.

The yacht will be lighted throughout by electricity and she embodies all the principal new features that have been found useful for this type of craft. The joiner work will be of hardwood and there will be six watertight steel bulkheads.

This type of vessel has proved exceedingly popular and is used by a large class of yachtsmen who are beginning to recognize the enjoyments of cruising through the inland waters of this country. The boat will pass through locks of the canals along the eastern seaboard and can be easily handled.

The arrangement provides very comfortable quarters below deck, and the motor room and crew's quarters being placed forward of the raised deck section, the after part of the vessel is left free for the use of the owner and his guests.

The amount of deck space is unusual for a craft of this type, and as the steering wheel is placed almost amidship, the owner can handle his craft himself if he wishes without being separated from the party aboard.



This V-bottom boat, which is described upon the following page, was shipped in knock-down form and set up by an amateur in a remarkably short space of time.

A Knock-Down V-Bottom Boat.

THE plans shown upon the bottom of page 41 are interesting because of the fact that the craft whose designs are given is the product of the Bath Marine Construction Company, Bath, Me., and all the parts were shipped knocked-down and crated to the owner, a Chicago man. The complete boat, down to the smallest detail, was designed and fitted together by the company, and after everything had been plainly marked, it was taken down and crated.

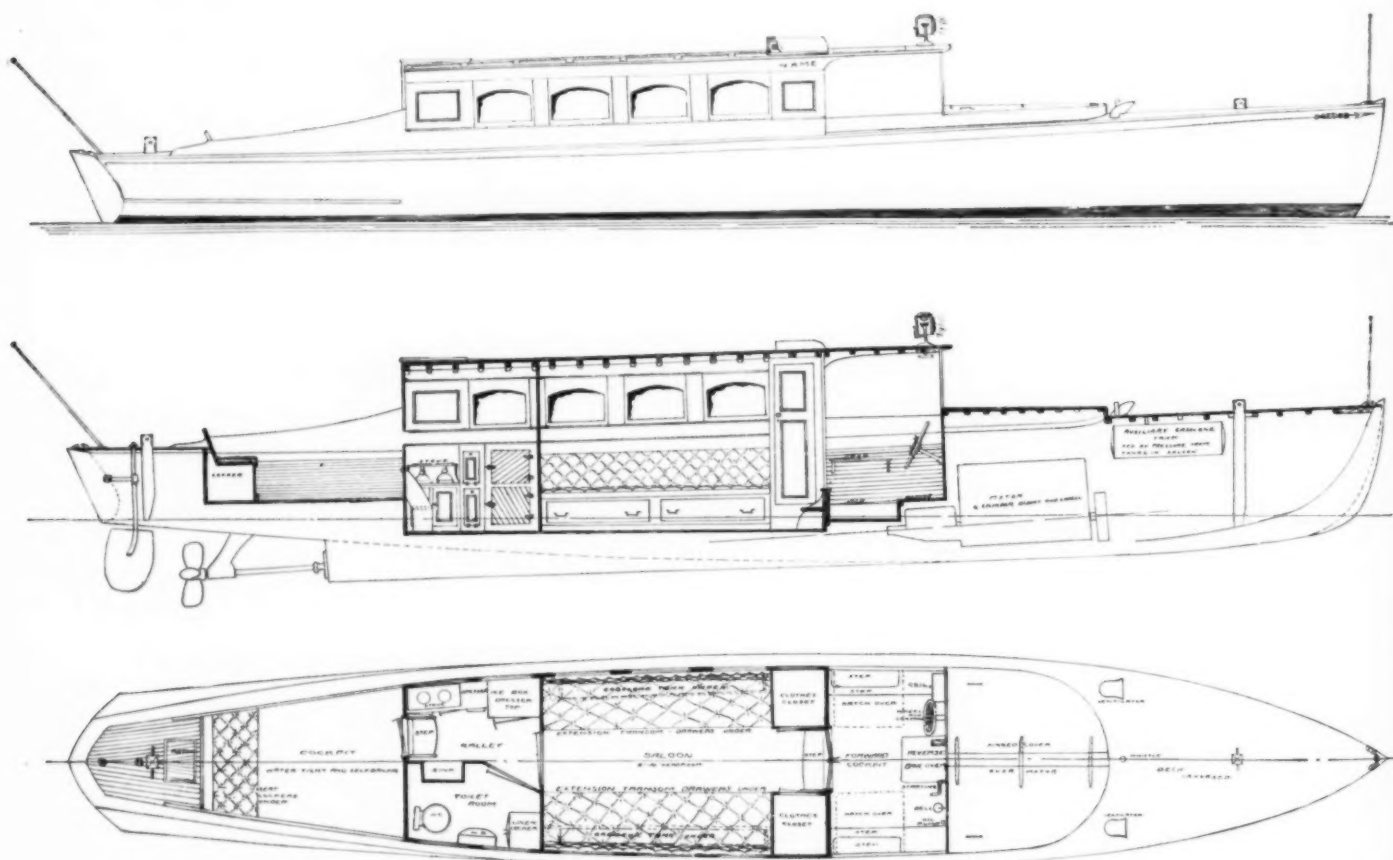
The method of construction and the assembling instructions were so simple that the purchaser, who states that he had never before even attempted to build a boat, was able to set it up in a day and to complete the inside work within a month, working on it only at odd times.

The method of construction of this type of boat shows a combination of the thwartship and longitudinal construction, the moulds or frames being either moulded of natural crooks or else built up of several pieces fastened together and set up at intervals along the length of the hull. These moulds are notched out to receive the keelson and stringers, which run fore and aft. These are screwed to the moulds and also to the stem and sternboard, which are notched to receive them. This construction provides a girder of the most rigid type.

In planking the boat, it is necessary only to lay the plank on where it is intended to go, mark its shape by running a pencil along the edge of the batten and after making the necessary allowances shown upon the design, cut out the plank to the mark, when it will fit

in place. With this method, it is not necessary to make the seams absolutely accurate, as each edge of the plank is fastened to the batten and a piece of cotton wicking is worked in with a suitable instrument, so that the seams cannot leak when completed. In the craft illustrated, all these parts were accurately fitted, so it was only necessary for the purchaser to put them together and fasten them. It will be noticed that the general appearance of this craft is of the ordinary round-bottom type, but owing to her V-shape construction, she can travel much faster with ordinary horsepower.

The boat is 21 feet, 9 inches in length and makes a very handy little runabout. As will be noticed, the automobile type of control is used, the wheel being upon the port side.



A speedy type of river cruiser. This class of vessel is becoming very popular in Southern waters owing to the shallow draft and ease of control.

A Fast River Cruiser.

ABOVE are shown the plans of a craft designed by William J. Deed, Jr., of Boston, Mass., which is under construction by the Adams Shipbuilding Company. This vessel is designed particularly for use upon lakes, rivers and enclosed bays, as she is of moderate draft and comparatively high speed.

Her dimensions are 45 feet over all, with a beam of 7 feet, 3 inches, and a draft of 3 feet. The least freeboard is 2 feet, 5 inches and the construction is such that full headroom of 6 feet is provided in the cabin.

The vessel has pleasing lines and the arrangement allows a midship cabin of good size, containing sleeping accommodations and a galley at the after end, with a cockpit both fore and aft.

The motor, which is a 6-cylinder, 4-cycle type, measuring 4¾ by 5½ inches bore and

stroke, is located under a hinged cover forward of the steersman's cockpit. The main gasoline tanks are under the transoms in the saloon, and an auxiliary tank is provided in this forward compartment. An automobile type of steering wheel is extended through the bulkhead aft of the motor and the steersman's cockpit contains all the necessary controls so that the vessel is strictly a one-man boat.

The saloon is 9 feet 6 inches in length and contains an extension transom upon either side, with ample clothes lockers. It also contains a dining table. Aft of this upon the port side, is the galley completely equipped and provided with unusually good ventilation, owing to its location. Upon the starboard side of the vessel opposite the galley is a toilet room.

The after cockpit is of the self-bailing type and is entered from the galley. A seat is at

the stern, with lockers underneath, and there is plenty of room for extra chairs to be placed in this cockpit, as well as in the forward one.

The craft has considerable flare forward so that the steersman is well protected from flying spray. In a storm, side curtains can be let down and the glass shield in front permits a view in all directions. The cockpit narrows toward the stern, but the V-shape of this part of the vessel flares out a trifle at the water line, so that there is no tendency to squat when under way.

The six-cylinder motor used develops 60 h.p. and is expected to drive the vessel at about 15 miles per hour. With the seaworthy hull, providing plenty of dead rise and flaring bow sections, the vessel has an unusual amount of stability and is light and strong in construction. For Southern use, in particular, this vessel should prove a very valuable one.

A 35-Foot Cruiser.

BELOW are shown the plans of a cruiser now under construction for Mr. Wilbur Weaver, of New Haven, Conn., by Lane & Wyman, of the same city.

This boat is 35 feet over all, with a beam of 9 feet, 6 inches, and a draft of 2 feet, 6 inches. The construction is of the flush-deck type forward and of the trunk-cabin plan aft, allowing full headroom of 6 feet throughout.

The owner's stateroom is forward with two comfortable berths, 6 feet, 4 inches in length, and contains two open ports upon either side and a skylight overhead. There is plenty of storage space underneath the berths and there is also another room for two swinging berths above. This stateroom is to be finished in white enamel and with its hangings and decorations will present a handsome appearance.

Aft of the owner's stateroom is the main saloon, which contains two extension berths, two lockers with book shelves, glass racks, etc., and a folding table to seat eight persons. This saloon is to be finished in cypress and communicates forward through a swinging door with the owner's stateroom.

The engine room is aft of the main saloon and contains a toilet and a companionway on the port side, with an ice-box, dish-locker and provision locker upon the starboard side, placed under a broad top dresser, which can

be used as berth if necessary. This room is also finished in cypress.

The power plant installed in this compartment consists of a 15 h.p. two-cylinder Mianus motor, which is located at the after end of the engine room.

The boat was originally designed to be fitted with a watertight cockpit, but since the owner plans to use the craft in Florida during the winter, it was desirable to change the designs and make the after part into a flush-deck type instead of the cockpit. The steering wheel and engine controls are placed upon the starboard side and the vessel may be handled by one man.

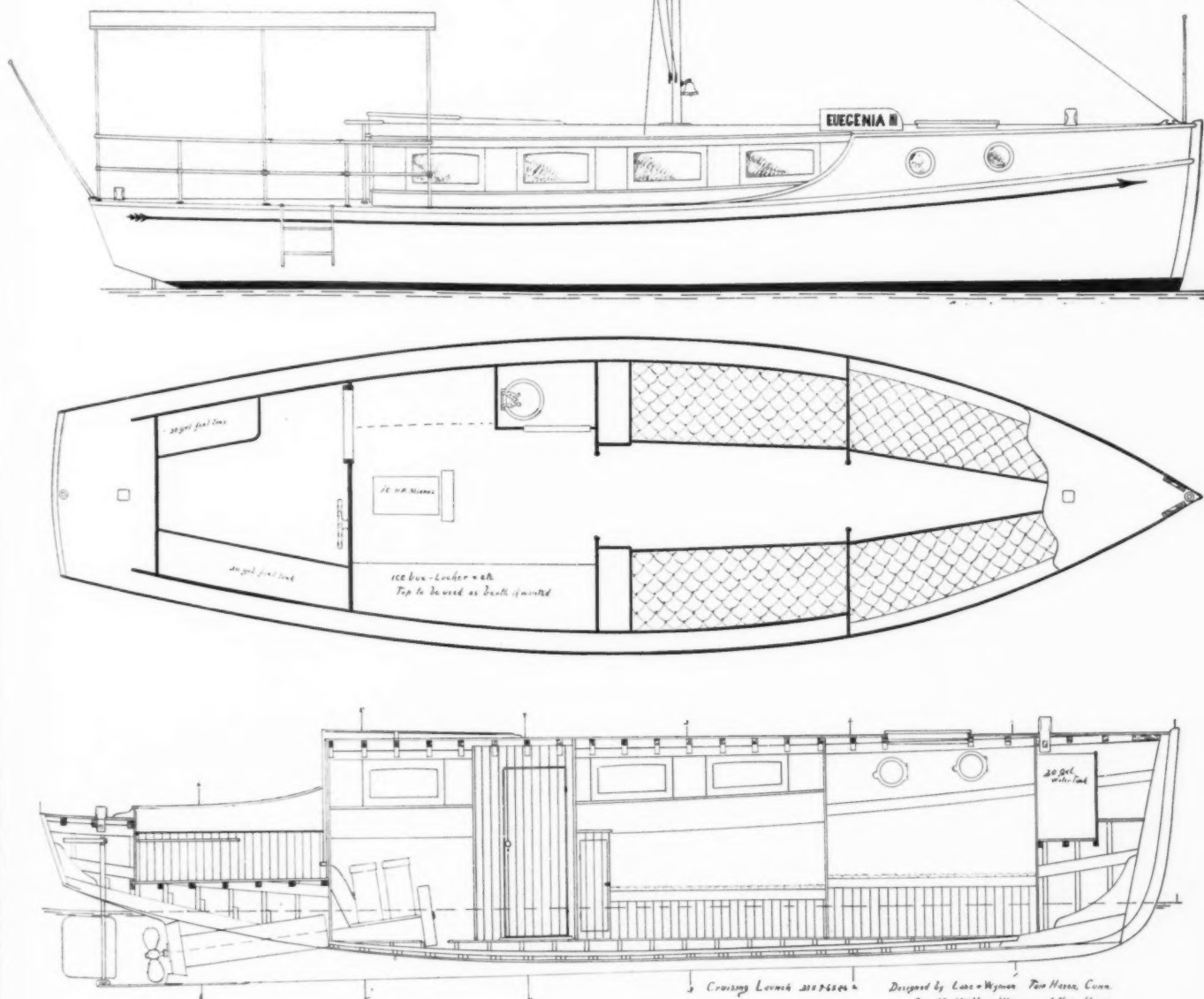
A 40-gallon water tank is installed just forward of the owner's stateroom and two 40-gallon fuel tanks, with a 5-gallon oil tank, will be placed under the after deck, where they are accessible and do not occupy valuable space.

The boat will be finished in cypress outside and the hull will be painted a dark lead color, with green under-

body. The vessel is fitted with a signal mast securely stepped and stayed so that sails can be used when desired. The after deck space is covered with a removable awning and chairs may be placed in this space so that it serves practically every purpose of a cockpit.

While this vessel is different in many respects from the regular type of Florida cruiser, she is a very serviceable craft and meets the owner's wishes in every particular. The below deck arrangements are simple and convenient and the motor is so placed that it is very accessible.

The plans of the owner required a craft that could carry a small party, but he wished the boat so arranged that he could run it himself the greater part of the time. For this reason, the steering wheel is placed some distance aft, so that the steersman will not necessarily be separated from the rest of the party. The cabin is well lighted by Pullman windows and the stateroom forward under the flush deck is fitted with port holes. The vessel has not a great amount of flare forward, but since the cabin is well protected and much of the time in pleasant weather will be spent upon the stern deck, rough water will not inconvenience the occupants.



Eugenia III is another one of this popular type of craft for use in Florida waters. She is built without a cockpit, using a flush deck construction instead.

Mione, A Sixty-Two-Foot Cruising Yacht.

THE plans shown below for a 62-foot cruising motor yacht for Mr. Chas. S. Gardner, of Philadelphia, are from the boards of J. Murray Watts, naval architect, of Philadelphia, and the yacht is now being built at the shipyard of Morton Johnson, of Bay Head, N. J.

This boat is a raised-deck cruiser of the sea-going type, and the arrangement below decks shows unusually large accommodations. There is a double stateroom aft with two full-size berths. A roomy bathroom and dressing-room is on the port side, and

a companionway is on the starboard side with two full-length hanging lockers on either hand.

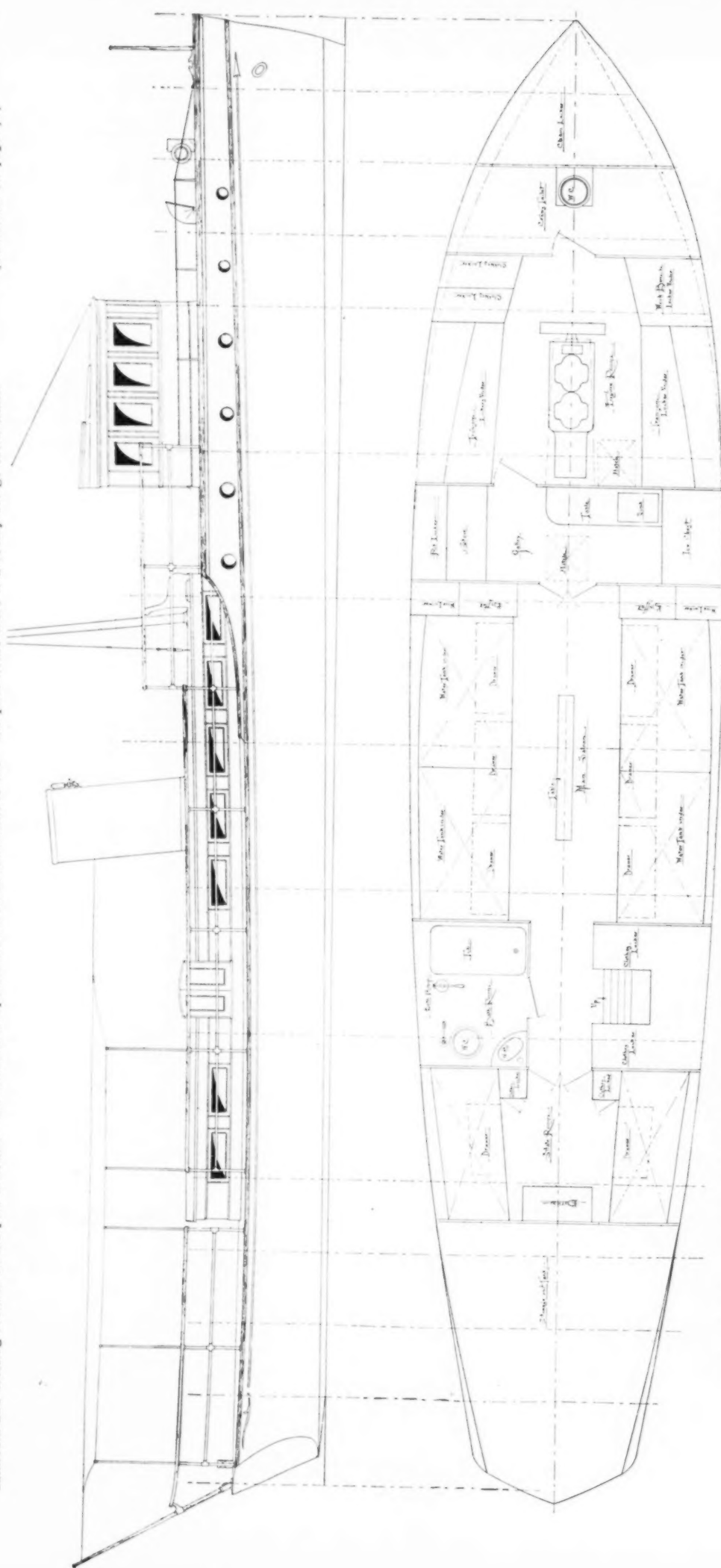
The main saloon is a feature of the boat, being nearly 16 feet long and 13 feet wide. There are four wide sofas in this room. A door leads into the galley from the saloon, and this galley is the full width of the boat and has an ice-chest on the starboard side, a stove and pot-locker on the port side and plenty of room for shelves and cupboards.

The engine room and crew's quarters are forward and there is a separate crew's toilet room next to the

chain locker. There is a pilot house, nearly 8 feet long, built right over the engine room. A narrow well about 2 feet wide, built directly over the engine cylinders, gives full headroom in the pilot house and does not take away any available headroom in the engine room. There is a ladder leading from the pilot house down to the engine room, and the reverse gear and all controls from the engine are brought up to the steering wheel so that the vessel can be handled by one man. Besides the steering wheel in the pilot house there is a roomy bridge from which

the boat can be coned in narrow or difficult waters. The outboard appearance of this boat shows great simplicity and very little top hamper. There are no skylights or ventilating cowls on the cabin house, all the ventilation being taken care of through one big stack. In hot weather the electric ventilating fans will exhaust the various compartments through ducts into this stack.

The electrical outfit will be unusually complete on this craft, as there will be an independent lighting (Continued on page 48.)



Mione is built for service both in deep sea cruising and shoal water and for this reason her weights have been balanced with great care. She has a heavy displacement.

A 98-Foot Cruiser for Southern Waters.

WHILE at first glance, the plans shown below may appear to be those of a somewhat conventional cruiser, a close inspection will reveal the fact that there are many exceptional details of particular interest which will add much to the convenience and comfort of the vessel. The designs are from the board of Morris M. Whitaker, Metropolitan Tower, New York, and the craft will be built for a yachting enthusiast of New York City, who has owned several vessels, and he himself has suggested from his own experience a number of the novel details incorporated in this design.

The general outboard appearance is the conventional raised-deck cruiser, and the novelty is shown in the below-deck arrangement, which is far different from the majority of boats of this type in which it is impossible to walk through the boat below deck from end to end. It will be noticed that a passageway extends from one end of the vessel to the other, and while there is sufficient room to provide accom-

modation for a party of considerable size, there is no space wasted and all the accommodations are comfortable and well planned for a cruise of some length. The owner does not wish, under ordinary circumstances, to carry large parties, and it is his idea when alone on board to use the owner's stateroom, which is upon the starboard side and connected with a bath. When the owner and his family are aboard, it is his intention to use the two connecting staterooms upon the port side, or when they are aboard with guests, to use the starboard stateroom, reserving the two port staterooms for any ladies

who may be aboard, and assigning the gentlemen to the Pullman berths in the after cabin. This is an excellent arrangement, since these

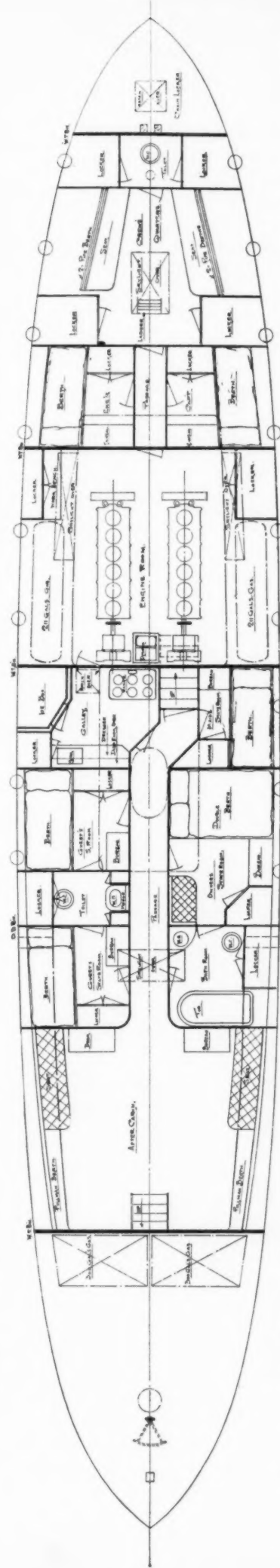
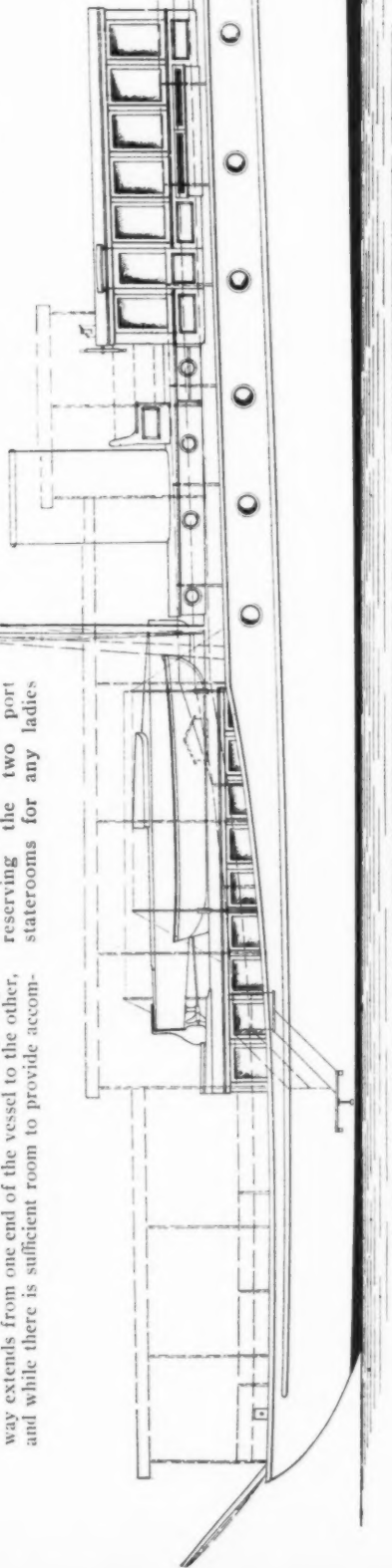
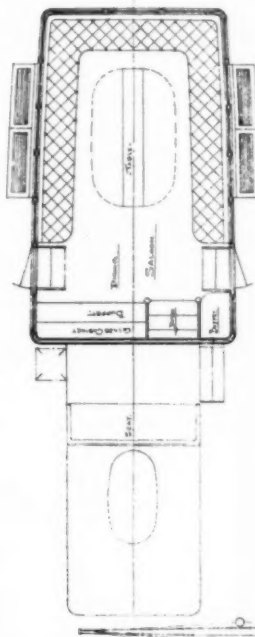
berths are very comfortable and are installed in a room that is practically 13 feet square, securing all the benefit of light, air and ventilation.

Another consideration in carrying out this design was the separation of the crew from the owner and guests. A stateroom is provided for the maid or cook next to the galley, the galley being arranged so that it is a simple matter to serve either into the dining saloon in the deck house or in the after cabin.

The after deck is of good length, measuring 19 feet by the full width of the vessel, and there is a comfortable seat provided aft of the pilot house under which can be stored charts and deck fittings. The vessel will be steered principally from this point, which is protected by an awning as is the entire aft part of the vessel.

The dining saloon is equipped with leather upholstered seats around three sides, and a large table, as well as a glass cabinet and buffet. Com-

(Continued on page 48.)



This cruiser, designed by Mr. Whitaker, shows some novel ideas in interior arrangement. She is 98 feet long and will travel 15 miles per hour with her twin screws driven by six-cylinder motors.

A New 72-Foot Cruiser for the Thousand Islands.

DOLPH II, shown below, building by the Matthews Boat Co., of Port Clinton, O., for Mr. W. G. Stuber, of Rochester, N. Y., follows the general lines and arrangement of the cruisers Leonor II, Jamaha and Ocoee, delivered during the season of 1911 by the same company. She is 72 feet over all with a beam of 13 feet, 6 inches, and a draft of 4 feet, 3 inches, and is primarily intended for use on Lake Ontario, St. Lawrence River and the eastern seaboard.

The decks are unusually large, and give a great deal of outside room. The boat is handled by one man from the steering wheel location or bridge deck amidships, the motor controls being brought alongside on a special bronze stand, so that they are convenient to the wheelman. It is so arranged that the motors can be operated by signal in the motor room if desired.

By referring to the plans, it will be noted that the

crew is accommodated under the forward deck, there being a permanent single berth and a folding pipe berth opposite, with a toilet compartment adjoining. A watertight steel bulkhead is placed just aft of the crew's compartment, exit to deck being arranged through a mahogany scuttle.

The boat is divided into four watertight compartments, there being two steel bulkheads and one double thickness wooden bulkhead.

The dining-room, or main living room, is large, with an idea to thorough comfort. A wide divan seat, which is about 6 feet, 6 inches in length, is arranged at the forward end of the room, the balance of floor space being suited for chairs and a mahogany folding table, alcoves, drawers and lockers being provided under the decks. Light and ventilation are secured by means of bevel-plate windows and four 9-inch hinging bronze ports forward.

A large ornamental buffet and a locker are installed at the after end of the room. The windows and entrances of this room, as well as of the other cabins, are thoroughly screened throughout by fine mesh copper screening.

The galley, which is reached through a doorway on the port side, from the dining saloon, is arranged for the port side of the motor room, and provides for a large refrigerator filling from the deck, a sink, stove-bench, and 3-hole stove, dish-racks and lockers. Hot and cold water connections are provided at the sink, and at all lavatories.

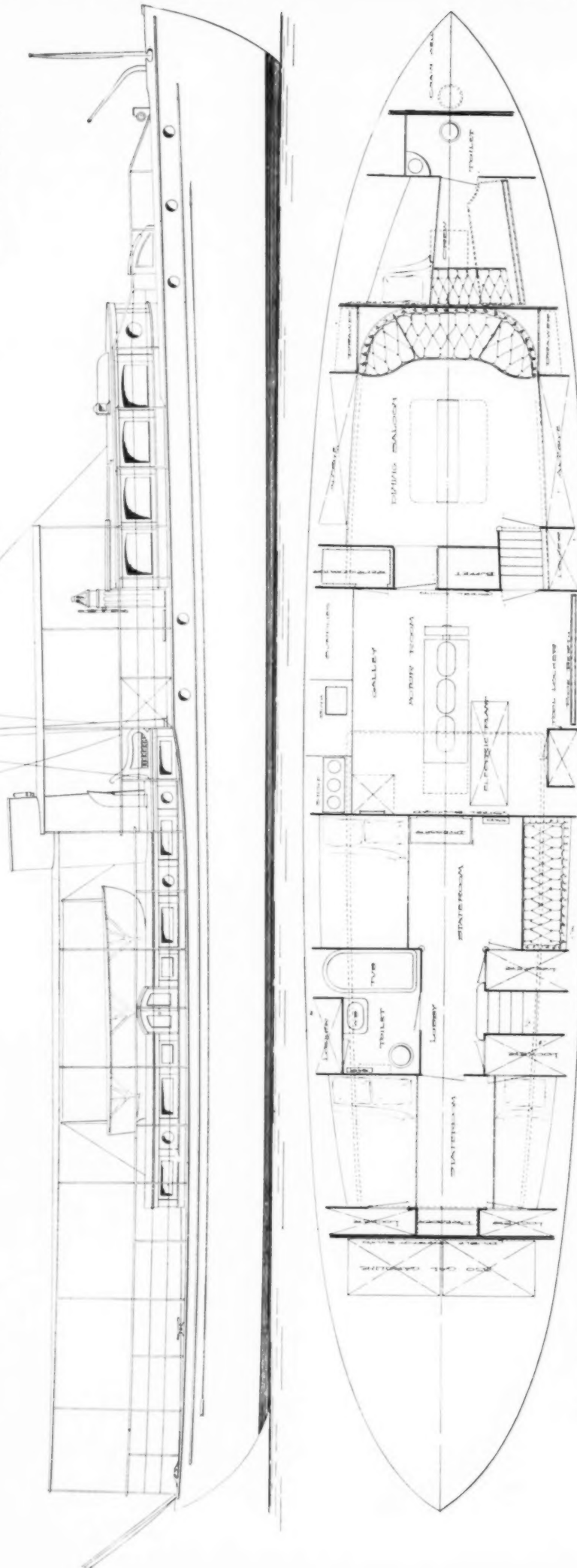
The motor room has good space throughout, and accommodates a 6-cylinder, 6 x 8-inch Standard motor, with deck and motor-room controls. An independent Fay and Bowen electric plant is in-

stalled on the starboard side, with special bilge pump connections on a large engine and independent plant. The balance of the space is divided up into storage and tool lockers, battery locker, etc. An exit hatch is over the motor room. Light and ventilation are secured through cowl, stack, windows and ports. An interesting feature in the installation of the batteries is that they are installed in a lead-lined compartment, having mechanical ventilation directly outboard throughout this compartment, thus obviating any acid fumes in the cabin.

An interesting feature worked out in connection with the electric plant, which was also worked out in Ocoee and Jamaha, is a means for heating the boat and furnishing hot water at the lavatories.

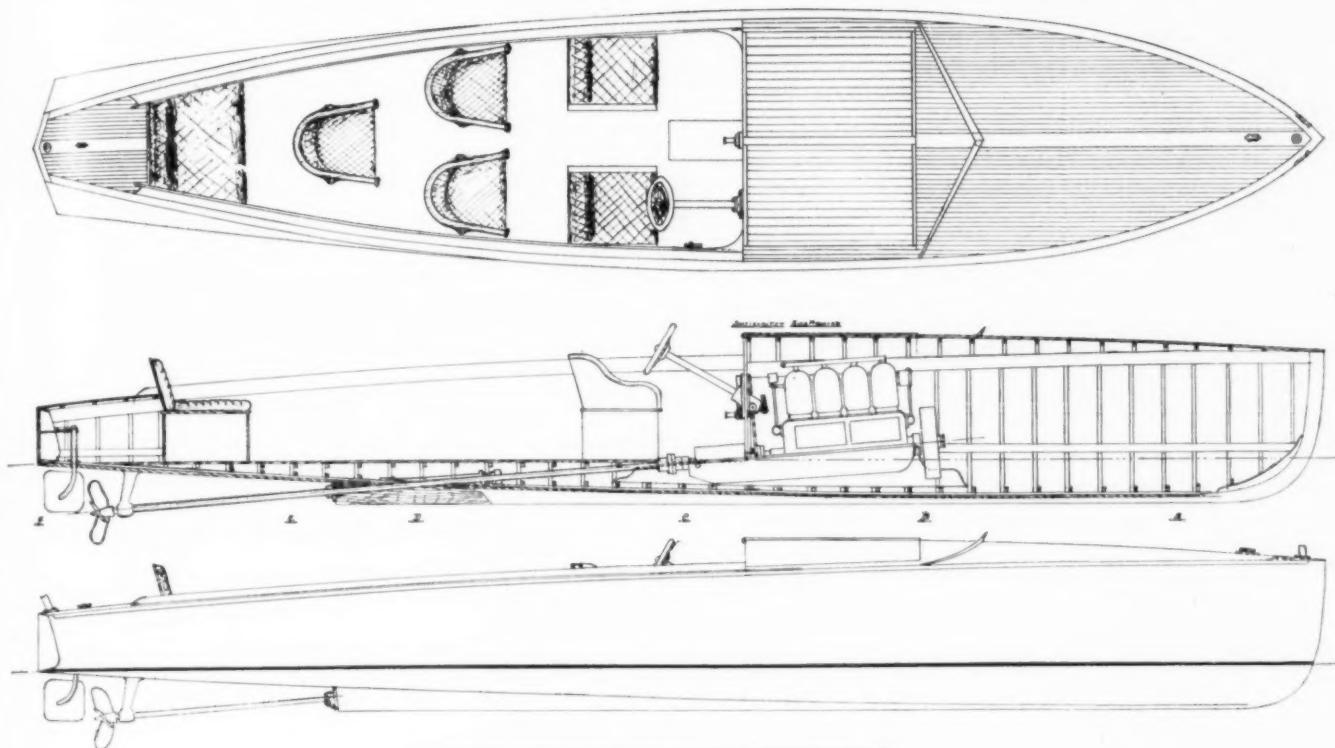
Gravity feed at the lavatories and tub is effected by special tanks which are filled from the main water tanks by the independent engine. The circulating water from the main engines passes through the

(Continued on page 48.)



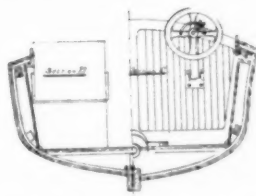
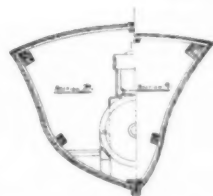
This craft will cruise to the Thousand Islands in June upon her maiden trip. She is well arranged for comfort and has many points in common with Ocoee, previously described.

A 30-Foot Stock Runabout.



TWO of these runabouts shown above are at present being built by their designers, S. S. & R. P. Breese, of New York City—one for a member of the Indian Harbor Yacht Club at Greenwich, Conn., and one for a Buffalo yachtsman. They are to be powered, one with a 40 h.p. Van Blerck, and the other with a 45 h.p. Niagara motor, and should prove interesting examples of their type.

The plans show a fast and seaworthy runabout which embodies in a modified form the

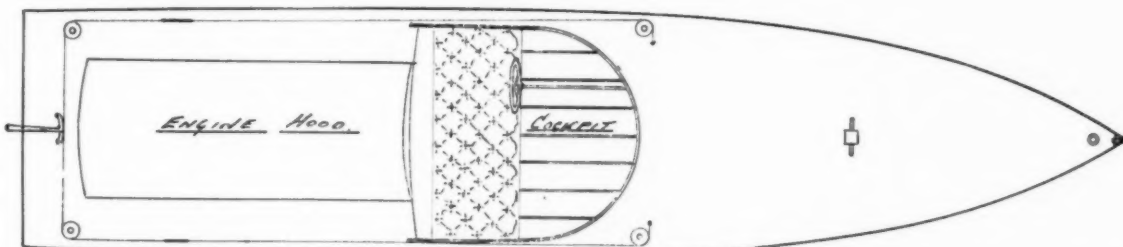
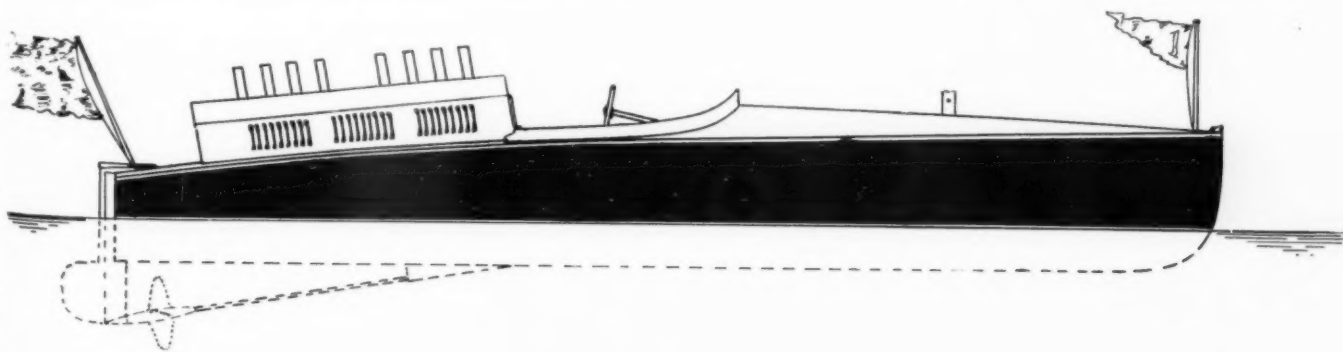


Plans and sections of the Breese stock runabout. She is 30 feet long and is designed to make 22 m.p.h.

principles shown by the hydroplane to be essential in a small boat of good beam and seagoing qualities. The craft is 30 feet long and has a beam of 6 feet, and with the flare shown in the sections should prove an exceptionally dry boat.

The motor is well protected by the hinged covers and is located just forward of a bulkhead through which an automobile type of steering column projects up on the starboard side. The seating arrangement is somewhat novel and there is plenty of

room provided for five passengers. The speed is about 22 m.p.h. with the horsepower used, but it is thought that an even greater speed can be secured with a more powerful motor. The location of the engine will effectually prevent squatting at full speed.



This hydroplane will be built during the coming summer by the Lüders Marine Construction Co., of Port Chester, N. Y. She will be provided with 100 H.P., which is expected to drive her at 37½ m.p.h. Notice the location of the motor.

A Launch for Mexican Waters.

THE launch shown below is from the designs of W. F. Ruddock and will be built by the W. F. Ruddock Boat & Yacht Works, of New York City, for service in Mexico.

The vessel is 50 feet in length with a beam of 10 feet and a draft of about 3 feet. She will be copper-fastened throughout and the hull will be covered with copper to a point 6 inches above the water line.

The keel, stem, stern and deadwoods, as well as the frames, will be of white oak, the frames being steam bent and spaced close.

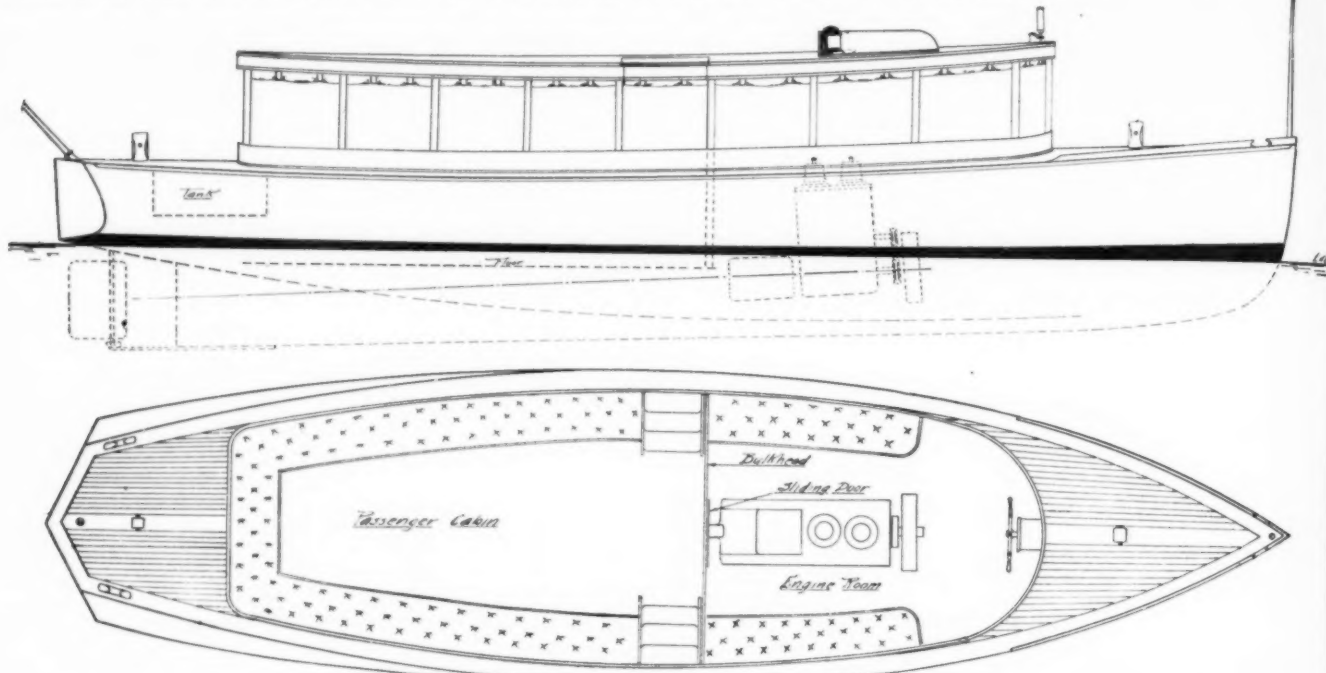
Each frame will have a floor timber and a yellow pine keelson will be run over the frames and bolted through to the keel and fastened with copper.

The house, as shown, will be a standard roof top and the motor will be placed well forward, so that the man at the wheel can handle it without assistance. Aft of the engine a bulkhead will be placed, with a door in the center so that passengers will not come in contact with the motor.

Since the vessel is intended particularly for passenger-carrying, the seats are arranged to

run along the sides and the stern, and additional space is provided by seats along the side of the compartment in which the engine is placed. Curtains are used to protect the cabin in stormy weather.

The interior finish of this craft will be of oak, and the decks, floors and cabin roof will be of pine. The rudder and skeg will be of Tobin bronze or composition metal. The motive power will be furnished by a 30 h.p. Mietz & Weiss oil engine, which is expected to drive the craft at a good average speed for her purposes.



This launch has been designed especially for passenger-carrying and is of very steady lines. She is built for service in Mexico.

Mione, a 62-Footer.

(Continued from page 44.)

set, consisting of a 2-k.w. Holzer Cabot dynamo driven by a 2-cylinder Brown engine. The generator will be compound-wound so as to handle the 80-volt 10-inch searchlight, and there will be storage batteries to take care of the 8-volt Tungsten incandescent lights.

The main engine will consist of a 40-h.p. 6½ x 8-inch heavy-duty Sterling motor, which is expected to drive the boat at a speed of 12 miles.

As the owner expects to use the boat in Florida for shoal waters, the draft has been kept down to 3 feet 6 inches. The finish on the outside of the boat is of Honduras mahogany, the decking being of narrow strips of clear white pine with mahogany covering board and king plank. The raised deck is similar to the main deck instead of being canvas-covered as has been the practice in most of these boats.

As in spite of the shoal draft, this boat is required to be able to take long trips in the open, the weights have been carefully placed to reduce rolling as far as possible. Very large fresh water tanks are carried amidships in either bilge, winged out to each side as far as possible. The storage batteries are located in the same way, and the large gasoline tanks, with a capacity of 400 gallons, are located aft, also on either side under the after deck.

The displacement is unusually heavy, owing to a very strong construction, the scantlings being almost double that of the ordinary pleasure yacht of this class. The result is that she will act like a ship at sea instead of tossing around as does the usual lightly built motor boat of this class.

A 98-Footer Cruiser.

(Continued from page 45.)

munication with the galley is down a short flight of steps, and it is possible to serve from this galley either direct through the buffet into the dining saloon or through a small watertight door to the crew's compartment forward. The exhaust from the engine and the smoke pipe from the galley stove are carried over the deck under the bridge and into a funnel, thus forming a natural draft and ventilator for the galley as well as the owner's and forward port staterooms.

The engine room is divided from the remainder of the vessel by watertight steel bulkheads, and the power equipment installed will consist of two 150 h.p., 6-cylinder motors which will drive the vessel at a 15-mile speed. The fuel supply is carried partially in the engine room and partially under the after deck, giving a total carrying capacity of a trifle over 1,000 gallons. The water supply of 500 gallons will be carried in the bilge, from which it will be pumped to a tank under the trunk aft of the pilot house, and from here it will flow by gravity to different parts of the vessel.

An independent electric lighting outfit is furnished, to which will be attached a fire and bilge pump, and the owner is considering the installation of a hot water heating outfit, so that the boat may be used throughout the entire year.

The length of the vessel is 98 feet with a beam of 17 feet, and while she is of fairly heavy construction, the draft has been limited to 4 feet, so that she may be used in Florida waters. In form the craft is very similar to Caroline, by the same designer.

A 72-Footer Cruiser.

(Continued from page 46.)

hot-water tank, and requires about 15 minutes to get the water nearly to a boiling temperature. This can be disconnected, and the circulating water directed through the hot-water radiators throughout the boat; and there is just enough water in this radiation system to keep the jacket water at a high temperature, but not too high for cooling the small engine cylinder. This engine is also arranged with circulation of water from outboard direct, there being three distinct and separate systems for this circulating water.

Aft of the motor room is a steel watertight bulkhead, with a stuffing-box on the shaft. The sleeping quarters at the after end provide for owner's and guests' staterooms, each extending the full width of the boat, and fitted with double and single berths, as shown on plans.

A good-sized lobby is arranged at the foot of the companionway stairs, and a large bathroom is placed between the two staterooms.

The 450 gallons of gasoline are carried under the after deck, this compartment being separated from the cabin by a double thickness watertight bulkhead. The cruising radius of the boat will be 600 miles on one filling of the fuel tanks.

The special features sought in the boat are comfort and safety, with speed as a second consideration. Every want of the owner is provided for, and little special features that can only be appreciated by inspection. The large amount of deckroom that is available has made this type particularly attractive. The vessel will cruise to the Thousand Islands in June upon her maiden trip.



A busy day at the Frontenac Yacht Club in the Thousand Islands.

The Hartford Yacht Club, Hartford, Conn., at the annual meeting held in January, elected the following officers to serve for 1912: Commodore, Chas. A. Goodwin; vice-commodore, Francis R. Cooley; rear-commodore, Chas. H. Symonds; treasurer, John E. Stewart; secretary, Edward B. Barker; measurer, H. D. Olmsted; fleet surgeon, J. F. Axtelle, M. D.; fleet captain, Gilbert F. Barby; chaplain, Rev. E. DeF. Miel; historian, F. E. Dayton; trustees, H. P. Redfield, Louis F. Heublein.

The Ocean City Motor Boat Club is making active preparations for the first open regatta, to be held next summer on the South Jersey Coast. The date is Saturday, June 29th, and the regatta committee is looking forward to an appropriation of upward of \$500 for trophies for the occasion. Several of the club's officers and members of the board of trustees have likewise signified their willingness to present special trophies for the 1912 racing season. The regatta committee consists of H. D. LeCato, E. J. Berlet, Maurice Daniels, Samuel Jacobs, Augustus E. Snow, G. Alvin Snook and W. R. Stanert. Commodore Wilson has appointed as his board of judges: Wm. H. Hurst, chairman; J. S. Riddell and Gen. Chas. Shaler. The timekeepers will be Harvey Y. Lake, Daniel Clawell and E. G. Weimer. A special publicity committee has been appointed, consisting of E. J. Berlet, chairman; John Clare and A. E. Snow.

The West Hudson Yacht Club, Kearney, N. J., at the annual election held January 18th, chose the following officers for 1912: Commodore, David Gillow; vice-commodore, T. N. McNish; financial secretary, S. T. Hard; recording secretary, C. W. Dukes; treasurer, F. A. Clark; measurer, R. S. Young; fleet captain, J. Griffin; sergeant-at-arms, E. Rue; board of directors, W. Rue, J. Williams, G. Taite, J. P. Hamilton, Jr., and the officers.

The East Greenwich Yacht Club, of East Greenwich, R. I., is now under the direction of the following officers: Commodore, F. Herbert Smith; vice-commodore, Dr. Wm. H. Heald; rear-commodore, Henry E. Allen; secretary, F. S. Nock; treasurer, L. W. Dugdale; fleet captain, M. A. Newcomb; fleet surgeon, Dr. F. G. Taggart; measurer, F. S. Nock; assistant measurer, G. L. Spencer. Chairmen of the various committees are as follows: House committee, M. P. McCabe; racing committee, S. Nock; ways and means committee, Frank Church. Representatives to the Narragansett Bay Yacht Racing Association: F. S. Nock, Wm. Nason and C. H. Mandeville.

H. T. Koerner, president of the **American Power Boat Association**, presented a very satisfactory report at the annual meeting of the association held in February. According to this report, the association now has over 140 clubs and an individual membership of over 26,000. During the past year two new and powerful local sections were added to the organization, namely, the Delaware Yacht Racing Association of twenty clubs and the Buffalo section, including all the prominent clubs on the Niagara frontier. Mr. Koerner made a plea in his report for a more extended field for amateur racing and deplored the growing tendency of motor boat contests to develop into merely professional events.

The Eastern Yacht Club is planning to have Prof. Harold A. Everett, of the Massachusetts Institute of Technology, appointed by all the yacht clubs in Boston Bay as official measurer. This will at the same time assure the services of an expert, as Prof. Everett is in the department of Naval Architecture and Marine Engineering, and secure uniformity of measurement.

The Westville Power-Boat Association, Westville, N. J., at a meeting held on February 10th, elected the following officers for the coming year: Commodore, Chas. Hassenforder; vice-commodore, D. W. Humphreys; rear-commodore, D. R. Janney; secretary, Jas. T. O'Brien; treasurer, G. Chas. Ade; fleet surgeon, J. D. Groves, M. D. Trustees are: C. Hassenforder, J. T. O'Brien, G. Chas. Ade, A. Weber, E. Bardsley, Wm. Quin, L. A. Deuchar, E. H. Buckalew and M. Gibson.

The Ocean City Motor Boat Club, Ocean City, N. J., held a nautical smoker on the evening of Wednesday, February 21st. The committee, of which Harry D. LeCato is chairman, provided a program containing many novel and interesting features for the entertainment of the members.

There is news of prosperity and progress from the **Motor Boat Club of Portland, Ore.** The club has only been organized about eighteen months, but it has already 135 members, including the Oregon Speed Boat Association, which owns the Oregon Wolf, the crack Pacific Coast speed boat. The club expects to hold its races on Decoration Day as well as in the first week of June, during the Rose Carnival, and in the latter part of July, during the Elks Reunion. If enough money can be raised for the Elks Reunion races, the Pacific Coast Championship races will be held in Portland at that time. Officers of the club are: C. W. Boost, commodore; Jas. B. Welch, secretary; August Fleming, treasurer; Geo. Kinnear, fleet captain, and Dr. Chas. E. Hill, fleet surgeon.

The Philadelphia Yacht Club, Philadelphia, Pa., has elected the following officers to serve for 1912: John H. Bromley, commodore; Philip H. Johnson, vice-commodore; Bernard Bloch, rear-commodore; S. W. Bookhammer, recording secretary; C. C. Cook, financial secretary; Alexander G. Rea, measurer; Dr. F. J. Haerer, fleet surgeon, and Geo. F. Schilling, harbor master. The trustees are: Wm. H. Christy, A. L. English, Jos. Price, Geo. W. Fite, W. N. Stevenson, S. B. S. Barth and R. J. Williams.

The Ocean City Yacht Club, of Ocean City, N. J., recently held its fifth annual smoker at the Columbia Club, with representatives from almost every yacht club along the Jersey coast. The total attendance was estimated at well over four hundred. A very elaborate vaudeville entertainment was offered for the amusement of the guests, which lasted until long after midnight. During the evening the retiring commodore, Wm. E. Hexamer, who has served the club in various official capacities for the past six years, was presented with a handsome jeweled watch fob, bearing the club insignia. The presentation speech was made by Commodore J. Ralph Wilson and in it he stated that much of the club's success was due to Commodore Hexamer's efforts. The Ocean

City Yacht Club is a member of the South Jersey Club Racing Association and will hold its open regatta on August 15th, in which all the clubs in the association will participate.

There was a large throng of yachtsmen and their families in the grand ballroom of the Waldorf Astoria, New York City, on the evening of February 7th, when the **Atlantic Yacht Club** held its midwinter social and ladies' night. A clever musical comedy or "aviation romance" entitled, "On the Wings of Love," was presented, written by Commodore J. Stuart Blackton, with music contributed by Alfred J. Doyle. Not only did Commodore Blackton write the libretto, but he and his wife assumed two of the leading characters in the comedy, assisted by the Knickerbocker Amateur Dramatic and Musical Society. Among the guests were the commodores and flag officers of the leading yacht clubs of the country, as well as prominent officers of the United States Navy. Following the entertainment, a dance was held in the Astor Gallery. It is hoped to make this only the beginning of a series of brilliant social entertainments.

The New York Motor Boat Club, New York City, held a shore dinner on the afternoon of February 18th at Witzel's Hotel, College Point, Long Island. The dinner was held in honor of the visitors to the New York Motor Boat Show. This gave an opportunity for motor boat enthusiasts from other parts of the country to get together with those interested in the sport in New York to the mutual pleasure and benefit of all concerned.

The Mosquito Fleet Yacht Club, Boston, Mass., at its recent annual meeting elected the following officers for the coming year: Commodore, Thos. J. Kelley; vice-commodore, Edw. L. Hopkins; secretary, R. S. Landers; treasurer, C. J. Driscoll; measurer, E. T. Landers; directors, Jas. H. White, Henry J. Lannon, Richard F. Quirk.

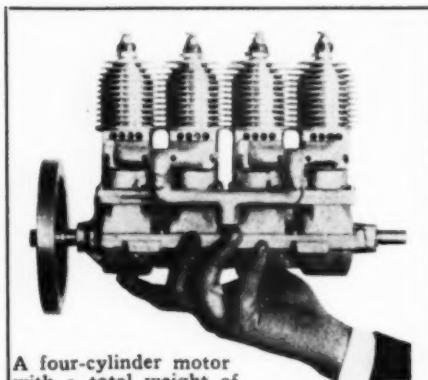
The Memphremagog Yacht Club, Newport, Vt., held its annual election January 30th, at which the following officers were chosen: Commodore, G. F. Root; vice-commodore, F. E. Alfred; clerk and treasurer, F. S. Tinkham.

A motor boat race to Cornfield light and return for Senator Hunt's trophy will be held June 22nd under the auspices of the **Colonial Yacht Club**, starting and finishing in front of the club house, 140th Street and the North River. The race will start at 3:30 p.m. Cruising boats between 25 and 45 feet, with a waterline beam of not less than one-fifth of their waterline length and which are enrolled in any recognized yacht club, will be eligible. This includes raised deck cruisers or boats with a hunting, trunk or glass cabin. The course will be from the start as above, down the Hudson, around the Battery and up the East River, past Throgs Neck, Stepping Stone and Execution Lights and thence northeast by east to and around Cornfield Point light vessel, returning over the same course. The total distance is 183 knots. Each boat must carry a crew of at least three persons. Six handsome trophies, including one time prize for the first boat to finish, are offered. Entry blanks, etc., may be obtained from the regatta committee of the club, 140th Street and North River.

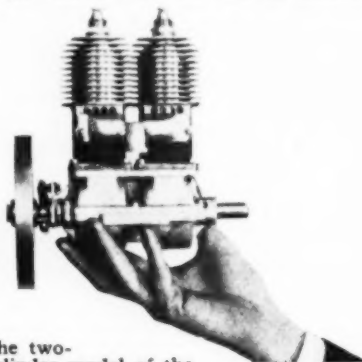
New Things for Motor Boatmen

The Baby Engine.

The Baby Engine Company, of Stamford, Conn., is manufacturing the engines shown in the accompanying illustrations, in one, two, three and four-cylinder designs, intended primarily for use in model boats and aeroplanes, although the four-cylinder type has been found practical for installation in canoes. The two-cylinder engine weighs $5\frac{1}{2}$ pounds, and develops 1 h.p. at 2,000 r.p.m. The equipment includes a carbureter, gasoline tank, spark plugs and ignition accessories. The price of this motor is \$75. The four-cylinder motor shown weighs 10 pounds, and develops 2 h.p. at 2,000 r.p.m. The price of this motor is \$100. The remarkable feature about these engines is their extremely small size and light weight, notwithstanding their strong construction. All parts are made in strength proportional to the large motors, but much weight is saved in cylinder construction, owing to the use of a special alloy of extreme lightness. The motors are made in both air and water-cooled types, the water-cooled engine weighing a trifle less. Special parts are used throughout, and the carbureter is one of the smallest ever made, being so compact that it can be stood on end on a twenty-five-cent piece. The bore and stroke are each $1\frac{1}{2}$ inches, and the motors can be throttled down to almost any speed desired.



A four-cylinder motor with a total weight of 10 pounds, suitable for use in canoes.



The two-cylinder model of the same type shown above developing 1 h.p.

New Type of Bosch Spark Plug.

The Bosch Magneto Company have improved their high-tension spark plugs for 1912 so that they are even more efficient and reliable than heretofore. The plug still consists of but three principal parts, a heavy central electrode, a one-piece insulator and a steel shell. The three electrodes are now made, however, in the form of a crescent, so that the electrical resistance is lower and the spark is produced in the form of a sheet instead of a ball, so that it will jump the spark gap at lower cranking speeds than with the other type. Steatite insulators are used, and the plugs are guaranteed to withstand a pressure of 750 pounds. The plugs are made in the three standard sizes and the various parts are easily changed if broken through any accident.

Turner Hot-Blast Tubular Torch.

The Turner Brass Works, of Sycamore, Ill., have designed and patented a tubular type of hot-blast gasoline torch, known as No. 101, which is shown in the accompanying illustration. This device produces a hot-blast flame which is easily compressed by the gasoline valve, and the construction is such that it can be adapted easily to a large variety of work. This torch is about 5 feet long and is made of heavy-gauge brass tubing, two inches in diameter, with a powerful burner at one end and a gasoline valve and pressure pump at the other. The long tube which contains the gasoline is delivered to the burner and holds about three quarts of fuel. A unique feature of this is the controlling valve inside of the tube, which regulates the flow of gasoline in such a manner that the torch can be used in any position necessary. Air pressure is provided within the gasoline chamber in the ordinary method by means of a pump at the end of the tube. The flame produced is about two inches long. The total weight of the torch, which consumes one quart of gasoline per hour, is 7 pounds, and it costs \$10.



The Turner tubular hot-blast torch.

Waltham eight-day chronometer.

The Col-Mac exhaust clamp.

Spark Plug Wrench.

The Emil Grossman Company, 250 West 54th St., New York City, have just brought out a spark plug wrench, which is designed to eliminate the liability of breaking porcelain when removing plugs from cylinders. The wrench is of the hexagon type and is flat enough to fit over the shell, without coming in contact with the porcelain. These wrenches are made to fit either the shell or the bushing, as it is frequently necessary to take out the porcelain to learn if any carbon deposit interferes with the spark, or to see that the points have not become placed too far apart. These wrenches are being furnished without extra cost with every set of Red Head plugs.

The Midget Spark Coil.

The Connecticut Telephone & Electric Company, of Meriden, Conn., makers of the well-known Connecticut Spark Coil, have just placed upon the market what is said to be the smallest stock size in the world. This coil is $2\frac{3}{4}$ inches long, $1\frac{1}{2}$ inches wide and $1\frac{1}{2}$ inches high, and is being used as a part of the regular equipment of all models by the manufacturers of the small engine shown upon this page. This coil is designed to operate with three ordinary dry cells and is unusually efficient, considering its size, although it is small enough to be used as a paper weight. The coil is a perfect duplicate of the larger sizes in appearance, but is very economical in its operation.

Waltham Eight-Day Chronometer.

The Waltham Watch Company, of Waltham, Mass., have just brought out an eight-day lever escapement chronometer, which is set in a case, as shown in the accompanying illustration, and is designed particularly for use on shipboard. It is provided with 15 jewels and is adjusted to temperature and isochronism. It has a compensated balance with the pivot running upon a diamond and double roller escapement, a sapphire jewel pin, and two extra long main springs. The winding crown winds both main springs simultaneously, and an indicator disc upon the dial shows a red signal when it is time to wind the instrument. The movement is enclosed in a dust and weather-proof case with a screw back and bezel. The box in which this instrument is suspended is of polished mahogany with brass trimmings and is thoroughly serviceable. The price is \$60.

Col-Mac Exhaust Clamp.

The Breeze Carbureter Company, of Newark, N. J., are manufacturing a device known as the Col-Mac, to overcome the difficulties common to the ordinary methods of heating carbureter jackets so that the mixture will be of the proper temperature to vaporize easily. The illustrations show the Col-Mac hood attached to an "L" with a clamp for the main air supply of the carbureter. The bolts are taken out of the hood first and the spring brass, of which the hood is built, is then placed around the exhaust pipe and the bolts tightened. The hood is kept away from the exhaust pipe by upset brass pieces and the warm air from the exhaust is allowed to circulate freely through the flexible tubing, so that when it is drawn past the spray nozzle it is so heated and dried that the gasoline is readily vaporized. This hot-air connection will give a uniform mixture at all times of the year and is said to effectively prevent condensation of fuel in the inlet pipe. The retail price complete, with 18 inches of flexible tubing, is \$2.50, with \$1.00 extra for each additional foot of tubing.

Duplex Ignition System.

The Duplex Magneto & Spark Plug Company, of 466 17th Street, Brooklyn, N. Y., have brought out a new ignition system, in which accessibility is particularly emphasized. The most important part of the system is the interrupter or circuit-breaker with its platinum points, which is placed on the top of the instrument between the magneto and the distributor plate, where it may be instantly removed. The magneto spark plugs used in connection with this system are designed especially for it and are unusually serviceable. With this system, both the high and low-tension currents are supplied through one magneto and one set of spark plugs, each operating independently of the other and either being stopped at will by simply throwing a switch on the dashboard. This system furnishes two distinct types of current to use at will.

* * *

Hartford Pumps and Plugs.

The Hartford Machine Screw Company, Hartford, Conn., have brought out a combination water pump and air compressor, the pump being of the rotary style, which allows not only the free circulation of water around the motor, but also forms a ready source of air for blowing the whistle or for places where compressed air is used. The air compressor of this pump is idle and not required to be in operation, but it is instantly connected by shifting a small lever, as shown in the accompanying illustration. This lever locks itself automatically wherever it is placed. The total weight is 16½ pounds. The H. M. S. spark plug, which is another product, possesses an unusual form of porcelain, giving extra strength. It has only one gasket, so that the expansion and contraction of both porcelain and attached metal parts are practically in one direction. It is a very simple plug to clean because the porcelain and electrodes are assembled at one unit. It is said that this plug will spark indefinitely, even when the points are immersed in oil.

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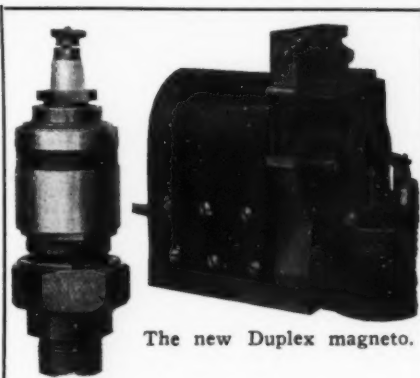
New Imperial Specialties.

The Imperial Brass Manufacturing Company, of 440 South Jefferson Street, Chicago, Ill., exhibited at the Chicago automobile show a number of interesting specialties which have just been placed upon the market, among which are the gasoline strainer shown upon this page, a pressure reducer, and an accelerator pedal. The main body of this strainer consists of a cylindrical brass casting, which is cored out with a central tube extending from the top down to the middle of the cylinder. Below this tube is a series of four wings, against which the gasoline is forced in, entering the strainer, thereby removing water or any foreign substance. The valve for regulating and reducing the pressure in the acetylene gas system is a valuable addition to the equipment of the motor boat. This valve is capable of reducing a pressure as low as 2 ounces, at the same time giving a steady flow of gas from a full or nearly depleted tank. The accelerator pedal operates upon a new principle with a forward horizontal motion and by its use, the foot remains in the natural relaxed position, without being affected by road jolts.

* * *

The Golden Glow.

The Apple Electric Company, of Dayton, Ohio, have realized the necessity of supplying a headlight that will penetrate a fog, and this year are offering a form of glass parabolic mirror, known as the Aplco-Fry Lens, or Golden Glow, which is useful as a searchlight. With the ordinary type of searchlight it is the glaring white light which makes fog particles visible, due to a certain quality in the light possessing ultra violet rays. The aim of the manufacturer has been to eliminate the ultra violet rays, and this has been accomplished by the use of a mirror lens with a golden tint, which absorbs these rays and reduces the glare. The result is a light which practically approaches daylight in value. The door of the electric searchlight has also been improved by eliminating the hinge and outside fastening and holding the door in place by two metal fingers inside, which can only be moved by screws in the bracket lugs. This can, in turn, be operated only by a special key provided for that purpose.

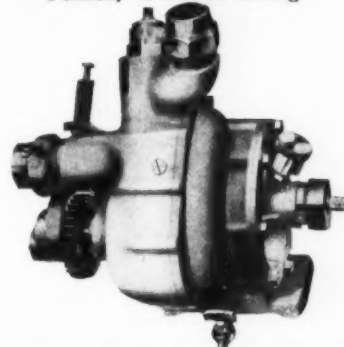


The new Duplex magneto.

The Duplex plug.



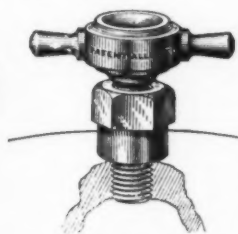
"Penflex," a flexible tubing.



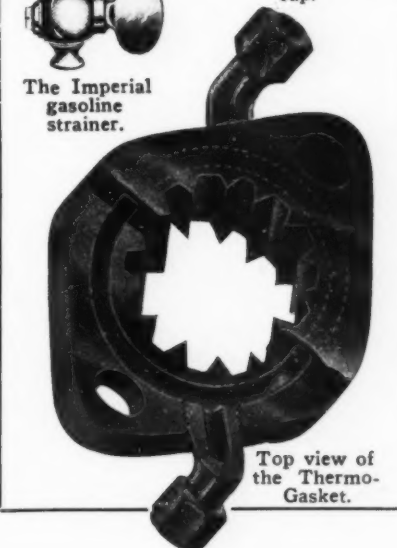
Hartford combined pump and air compressor.



The Imperial gasoline strainer.



The Morgan priming cup.



Top view of the Thermo-Gasket.

Penflex Lamp Connectors.

The Pennsylvania Flexible Metallic Tubing Company, of 1303 Arch Street, Philadelphia, Pa., have brought out the acetylene lamp connector shown in the accompanying illustration, which is designed to save the motor boatman the trouble usually occasioned by ordinary rubber tubing, which is so likely to split. Penflex is a flexible brass tubing, which is easily adjusted to any searchlight, and is very light and strong. It is exceedingly flexible and can be used in any place instead of rubber tubing. The ends are sufficiently elastic to form a tight fit over any connection, and there is nothing to wear out and no way in which the gas can be permitted to escape. The price is 50 cents a pair, but the tubing can be procured in any desired length for various uses.

* * *

G. & T. Carbureter.

A carbureter with only one wearing part and upon which the specific gravity of the gasoline has no effect so far as its working is concerned, is being manufactured by the Gallagher-Tompkins Co., 1874 Broadway, New York City. The parts of this device are controlled by mechanical regulation which is so graduated as to permit the proper amount of air and gasoline to enter and a dome on top is also provided which acts as a mixing chamber from which the motor draws its gases. The supply of air and gasoline is regulated mechanically and a double nozzle is used, one side of which comes into use only when the throttle valve is open. The needle valve has an adjustment by means of which the level of the gasoline in the float chamber can be raised or lowered without removing the carbureter, and nothing can effect the accurate action of the float for this reason. The \$35.00 size is adjustable to 1-inch, 1¼-inch and 1½-inch manifolds. Larger sizes are proportional in size.

* * *

The Improved Morgan Priming Cup.

One of the latest improvements to the priming cups manufactured by B. Morgan, Newport, R. I., is the one shown in the accompanying illustration, which is claimed to have none of the defects common to the old style priming cup. It cannot leak or stick, and the handles are so constructed that they will not break. The cup is easy to operate and gives a large and clear opening into the cylinder for priming purposes. It is small and neat, and being made principally from steel, does not require care in handling. It is made in three sizes, in the short type, selling for 45¢, 55¢ and 75¢, and in the long type selling for 55¢, 70¢ and \$1. This cup has been made in similar style for some time, but the latest models are improved so that they operate much more easily and cannot stick, no matter how hot the cylinder may become. They are made in standard threads so that they can be screwed into the original openings in the cylinder or else used elsewhere, as desired. The double handle upon the top greatly facilitates its operation, as this handle is much easier to operate than the ordinary type found upon most priming cups.

* * *

The Thermo-Gasket.

F. W. Batterschall & Company, 51 Maiden Lane, Albany, N. Y., have just brought out a device known as the Thermo-Gasket, which is designed to improve the running qualities of a motor, as well as to reduce the difficulty in starting. The device consists, as the illustration shows, of a gasket which is designed to be bolted between the carburetor and the intake pipe, and which is supplied with two openings, so that the exhaust may warm the mixture before it enters the cylinders, providing at the same time absolute safety in its operation. As soon as the engine starts, the heated exhaust gases are conducted through the Thermo-Gasket, thereby imparting heat both to the carburetor and to the intake pipe. The device is very easily installed, and there is no soldering necessary. It is not necessary to bore holes in any part of the motor, and since the device occupies practically no room, there is no space wasted. The Thermo-Gasket supplies heat to the mixture in from 30 to 45 seconds from the time the engine starts, and the result is an exceedingly smooth-running motor, which is started much more easily than without the use of the device.

A New Remy Magneto.

The Remy Electric Company, of Anderson, Ind., has announced a new type of magneto known as the R. D., for general multi-cylinder work and which is the evolution of the new inductor type. The new instrument is a two-magnet machine and weighs only a trifle over 20 pounds. The magnets are made from Tungsten steel and the cams are of Chrome nickel steel, especially hardened. The cam house of the new type is smaller than the Standard Remy instrument and incorporates improvements which are valuable to its operating qualities. This cam-house is removable, being held in place by a stiff spring. The distributor parts are made of a new insulating material known as "Bakelite," which is said to possess a greater electrical strength than hard rubber. The cone type of ball-bearings is used to eliminate the noise and fine oval-headed screws are substituted for the ordinary type, to add to the neatness in appearance. A full and complete line of these magnetos is being made for all purposes.

"Icy-Hot" Luncheon Basket.

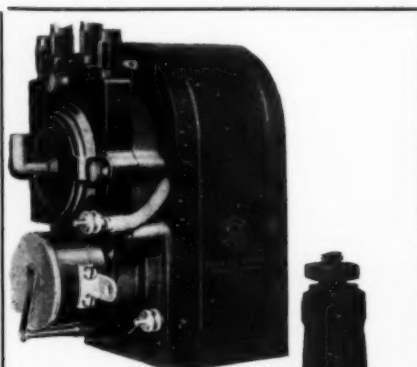
An ingenious and convenient type of luncheon basket for the use of the motor boatman has just been placed upon the market by the "Icy-Hot" Bottle Company, of Cincinnati, Ohio, and will, without doubt, prove very popular for cruises in a small boat. These baskets are handsomely made of English wicker and are equipped with plates, cups, saucers, knives, forks, spoons, napkins, salt and pepper shakers, an "Icy-Hot" bottle, a jar and a lunch-box, each article being placed in its own compartment to prevent rattling. These baskets are convenient to carry, light in weight, and can be stowed in almost any part of the boat. They are made in different sizes, providing for two, four and six persons.

A New Combination Switch.

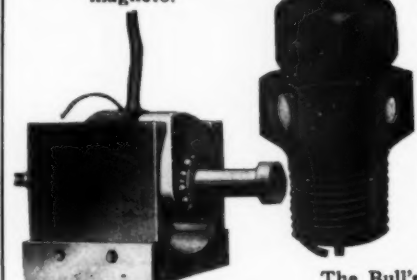
A combination switch fuse and junction box for use upon small electrically lighted motor boats has just been brought out by the Hartman Electrical Manufacturing Company, of Mansfield, Ohio. This device includes a selective drum switch with five lighting combinations and fuse box with each lighting circuit and the ignition circuit separately fused in the junction box forming the center of the wiring system, and a socket for a trouble lamp. The switch itself is of the drum type and has not been changed from the regular model. The junction box forms the center of the wiring system and greatly simplifies the wiring of the boat and allows much more rapid replacing of a fuse if blown out. All that is necessary with this system is to bring the lighting wires and the positive and negative wires to the terminal block extending from the bottom of the box, the proper connections all being provided within the box. It is necessary to bore only two holes in the bulkhead.

Waterbury Wireless Dry Battery Holder.

John C. Hopkins & Company, 119 Chambers Street, New York City, are selling a wireless dry battery holder designed especially for motor boats. This type is known as Model A and is made of oak handsomely finished with Spar varnish and is thoroughly waterproof so that it can be carried in exposed places in an open boat without danger of short-circuits or injury to the cells. It is adapted to any make of dry cell and it requires less than a minute to connect the outfit, all that is necessary being to remove a dry cell from its paper carton, drop it in the holder and snap the spring finger into the center of the binding post. There are no parts to wear out or break, and since all the connections are large, the battery will maintain a high amperage for a longer period than with the ordinary method. The contact springs are of bronze and the box is fitted with a leather-carrying strap. All the metal connections are nickel-plated. The price is \$7.50 and \$10.50, the former price being for a metal box finished in black enamel.



New Remy multi-cylinder magneto.



The Bull's Eye spark plug.



Armature of the new Remy magneto.



The new Hartman lighting combination.



The new Icy-Hot luncheon basket.

Bull's Eye Spark Plug.

A plug which made its appearance at the motor car show at the Grand Central Palace, New York, recently, and which appears to be constructed upon an excellent principle, is manufactured by the G. C. Blickensderfer Company, of Stamford, Conn. This instrument is known as the Bull's Eye spark plug and the illustration gives a clear idea of its operation. Ports of heavy crystal form a part of the plug's construction at its heaviest point, and through these ports not only can it be distinguished whether the cylinder in question is working properly, but the actual color of the flame produced can be clearly seen. If the flame is a blue color, the mixture is correct, while a yellowish white tinge shows an incorrect mixture. The color is so plainly shown that the carburetor may be adjusted until the proper flame is procured. This plug will also locate leaky valves by showing a yellow flame in one cylinder when the remainder are blue. These plugs are very easy to clean and the crystal parts are guaranteed not to break. They are sold at \$1.25 each.

Johnson Reverse Gear.

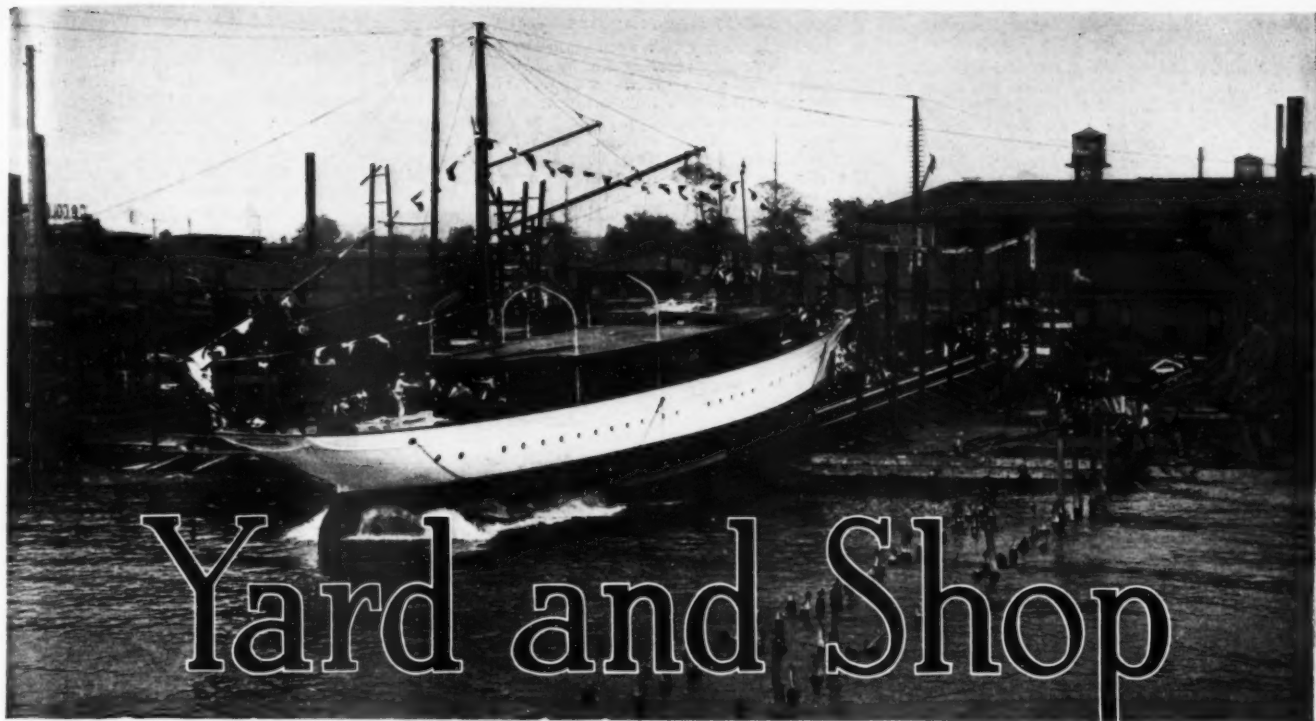
The Carlyle-Johnson Machine Company, Manchester, Conn., have made a number of improvements in the 1912 models of their marine reverse gears, the whole mechanism being now encased so that no sand or foreign matter can in any manner obtain access to the bearings. The working parts are easily accessible, however, and it is necessary only to loosen two thumb-screws to lubricate or adjust the moving parts after the outfit has been installed. On account of its compactness, it may be placed in many boats where the ordinary type of gear could not be used, owing to lack of space, and it operates with a smooth positive action and a noticeable lack of noise or jar. The general principles of the device have not been changed but the whole form has been rendered more suitable to the average boat of small size, and it presents a much more complete and compact appearance than the device previously manufactured.

Hurlbert Lock Deck Plate.

A deck plate that can be locked and which only the two keys furnished with it will unlock, is being manufactured by Wilcox, Crittendon & Company, Inc., of Middletown, Conn. The plate presents a handsome appearance and all screw holes and key-hole are covered so that no dirt can enter them. The plate consists of a metal ring, which is set into the deck opening and fastened by concealed screws from the inside of the ring. Within this fits the plate containing the locking mechanism. This is inserted so that it sets down flat against the flange, the top being flush with the deck when the plate is closed. The locking mechanism is operated by only two keys, which are furnished with each deck plate, and while it is simple in operation, the lock is so devised that it cannot be picked or opened by anyone not in authority. A hinged cover shuts down over the key-hole, allowing the outfit to be easily kept clean. It is highly finished in nickel plate and is an addition to the appearance.

Townsend Grease Gun.

A new grease gun has just been placed upon the market by S. P. Townsend & Co., of Orange, N. J., which embodies a number of novel points. It is equipped with a double-cylinder which permits a large opening being cut in the inner one through which the gun can be filled, eliminating the necessity as found in many guns, of unscrewing one end of the cylinder to fill it. This opening is 1½ inches wide and 8 inches long, and it can be readily seen that it is sufficiently large to enable the gun to be filled quickly and easily. The funnel with its cap acts as a receptacle for any grease that is spilled so that the hands may be kept clean, even when filling the instrument. The screw by which the grease is forced out through the nozzle does not shift longitudinally, as does the piston, so that while every bit of the grease is forced out by the plunger, no grease can make its escape through any of the joints in the instrument. It is made of heavy brass, highly polished, and is of very strong construction.



Launching of the La Belle at the yard of John Dialogue & Son, Camden, N. J.

Sintz Propellers.

The Wilmarth & Morman Co., Grand Rapids, Mich., makers of the well known Sintz reversing propeller, are now in a position to furnish this make of propeller wheel for all types of boats. Of course in all cases the fundamental construction is the same, but different service requirements call for different sizes and shapes of blades. The standard Sintz reversing propeller has a maximum pitch of 1.5 inches and the width of the blades is suited to most types of pleasure craft. Unless otherwise specified, blades on standard wheels are elliptical in shape. The Sintz reversing speed wheels are made up for each particular combination of boat and engine for which they are intended and there is practically no limit to their size. These wheels have been furnished as small as 14-inch, two blade outfits for hydroplane use and in some cases with a pitch ratio of 2, but this is, of course, unusual. The shell of the wheel does not, of course, do any pushing, and it is a well known fact that there is no push to the wheel until the water strikes on the blades at least a third of the distance from the center of the hub out toward the end of the blade. The shell of the Sintz wheel does not consume anything like a third of the diameter except on very small outfits, and this shell can be turned at 1000 r.p.m. in the water with practically no power and without resistance, a striking feature as compared to the amount of power it would take to turn the inside third of a solid wheel at this speed and to the resistance offered by it. The Sintz heavy duty outfits have a very strong construction, practically equal to that of a solid casting. A blow on one of the blades takes bearing on the other two. The only weak point in the wheel, namely the blade itself, is made as strong and heavy as the blade of any other wheel on the market, and the wheel is so constructed as to have a strength of $2\frac{1}{2}$ times the driving power of the shaft. The heavy duty wheels have extremely large blade areas to give the greatest efficiency in passenger and work boats for which they are intended. There is nothing on the Sintz propeller to catch weeds or debris. The drive through the shaft is distributed over the entire diameter of the hub and the blades cannot bind or stick and interfere with reversing. There are no caps or bolts on the blades, work loose, allowing the blades to come off or threaded ends which are liable to be broken off when the wheel strikes an obstruction, and the blades cannot be unlocked without removing the shell cap. Sintz wheels are furnished as small as 8-inch, 2-blade outfits for power canoes and up to 3-blade wheels 5 feet in diameter for heavy duty work and cruising boats.

A Correction.

The Wilmarth & Morman Company, of Grand Rapids, Mich., have called our attention to a mistake in the January issue of MoToR Boating on page 53, where they were given as the Wilmarth & Normon Company instead of by their proper name.

Hanly Cup Winner Equipped with Ferro Motor.

The launch Ferro, which won the Hanly cup for boats of the second class on Spirit Lake, Iowa, a short time ago, was designed and built by John Hafer, of Spirit Lake, and is equipped with a 1908 25 h.p. Ferro engine. The Ferro is 29 feet over all, by $4\frac{1}{2}$ feet beam. The races were in a series of seven, one being held each week by the Spirit Lake Yacht Club. The Ferro was the scratch boat in her class, 18 to 25 h.p., and easily won five of the seven events.

Spark Plug Maker Opens New York Office.

The Jeffery Dewitt Spark Plug Co. of Detroit, Mich., maker of the well known Reliance spark plug, has opened a New York office at 1789 Broadway, in which the Eastern business will be handled.

A New Aluminum Alloy.

G. A. Crayen & Co., 81 New Street, New York City, is putting on the market a new aluminum alloy known as Magnalium which, it is claimed, is even lighter than pure aluminum and can be used not only for crank cases, but for cylinders as well. Heretofore an aluminum alloy for cylinders has not been very popular owing to the difficulty of getting castings that were dense enough to hold the required pressure and because of the tendency of the alloys to crystalize under constant pounding or vibration and in a short time become brittle and crack. Another great objection to aluminum was that it would not stand the constant wear of piston travel. But in the last year an alloy of aluminum in which a small proportion of magnesium is contained has been manufactured in Germany and successfully used for aeroplane engine cylinders. This alloy is Magnalium. The metal is not only lighter than aluminum castings, but lighter even than pure aluminum because of the magnesium employed in its composition. It has about one-third the weight of iron and use has demonstrated that a Magnalium cylinder with an iron piston and piston rings seems to give as good, if not better, wear than an iron cylinder under the same conditions. An interesting fact about this metal is that it has been found to have a thermal conductivity from 7 to 8 times greater than that of iron, which of course will help to reduce the cooling problem.

A Fast Stock Model.

Adolph E. Apel, designer and builder of the famous Sand-Burr II, has made many improvements in his 1912 model and is building it as a stock model in three different sizes—16, 20 and 25 feet. The boats are built entirely of mahogany with a hardened brass bottom, decks of narrow strips of mahogany and spruce, frames and planking copper-riveted over burrs and fastened with brass screws where necessary. The entire engine compartment is covered by an adjustable hood which can be raised or lowered to different positions by means of stanchions. The motor is selected as required by the guaranteed speeds and is equipped with Bosch self-starting magneto or dual ignition system. The specified speed for each model is absolutely guaranteed and there will be no sale if the boat does not make it. The 16-foot hull is guaranteed to make 32 miles per hour equipped with a 40-h.p. engine and sells for \$2,000. The 20-foot hull with a 60-h.p. engine, selling at \$3,000, is guaranteed to make 36 miles per hour, and the \$5,000 25-foot hull will go at the rate of 40 miles per hour, equipped with a 120-h.p. engine.

Big Contract for Magneto Maker.

The Motsinger Device Manufacturing Company, Lafayette, Ind., are feeling happy over the fact that their new 15 magnet D. C. magneto has been adopted and specified as a standard equipment in a contract recently placed by the Lininger Implement Company, of Omaha, Neb., with the Field-Brundage Company for 2,000 Field engines to be delivered during 1912. This is a good sized contract as engine contracts go, as the monetary value represented will run considerably over \$100,000.

An Important "Trifle."

A good many people are inclined to regard a gasoline strainer as an unimportant trifle that could be dispensed with if desired without any very serious consequences. It is a fact, however, that impure gasoline can give a motor boatman enough worry to effectually spoil a good time and a simple strainer is often the only remedy needed. A good device of this kind is the Peerless strainer, manufactured by the Stott-Crowley Mfg. Co., Detroit, Mich., which will extract all dirt and impurities before the gasoline passes to the engine. Compared to the increased efficiency of the motor and the greater mileage obtained per gallon of fuel, the cost of the strainer is merely nominal, to say nothing of the annoyance saved by not having the "sweat" which often gathers on the inside of the tank when it is being filled, mingled with the gasoline. Much of the carbon which forms in cylinders is due to impure gasoline—another thing avoided by the use of a Peerless.

Marine Hardware Co.'s Yacht Plumbing.

The Marine Hardware Company of Peabody, Mass., has issued a circular describing their yacht water closets. These are made in four styles, ranging from \$25 to \$35. They can be used above or below the water line. The handle is composition, with no end to break off. When the handle is down, the piston rod sets on the lower valve, thus preventing the water from backing up. The supply valve is $\frac{3}{4}$ inch, with a special vent to bowl supply, making it impossible to create a vacuum in the water chamber when the valve is shut off. The company also makes an angle sea cock in sizes of from $\frac{3}{4}$ inch to 3 inches, designed to take up very little room. The flange is set at an angle of 45 degrees, so that it may be placed in any part of the boat. Prices run from \$2.25 to \$18. The cock is furnished with a straight coupling for lead pipe, but if iron pipe is desired, proper sized thread will be obtained by removing the coupling. In addition to these fixtures, the company is putting on the market a galley or basin pump at \$5 in brass, or \$6 nickel-plated. This is a double-action pump fitted with a spade handle and can be fastened to the bulkhead.

Page Now Marine Engine Sales Manager for the Ferro.

The Ferro Machine & Foundry Company, Cleveland, Ohio, announces the appointment of Mr. C. B. Page as manager of American and Canadian sales in the marine engine department. Mr. Page is a graduate of the Massachusetts Institute of Technology, class of '90, and is a member of the Society of Naval Architects and Marine Engineers. He was for some time connected with the Maryland Steel Company, at Sparrows Point, Md., in their marine engine department. More recently he was sales manager of the Pennsylvania Iron Works Company, makers of the Globe engine, at Eddystone, Pa.

Caille Motor in the Far North.

About a year ago, the Caille Perfection Motor Co. of Detroit, Mich., sold one of their 8 h.p. heavy duty, jump spark engines to J. A. Ricker of Newport Beach, Cal., who was contemplating a trip from Seattle to Nome, Alaska. When Mr. Ricker started, he was warned on all sides that it was a great mistake to attempt such a trip, where a man's life might depend on his engine, with a 2 cycle motor, but for the whole distance—1,200 miles in the Pacific and 2,300 in the Yukon River—his engine never stopped, balked, loosened a nut or gave the slightest trouble.

A Useful Advertisement.

The Richard T. Green Co. of Chelsea, Mass., which does boat building and work incidental thereto, has hit upon a method of bringing its name before the public which is very commendable. A large Eldridge chart of Boston harbor giving all the soundings, buoys, etc., is printed on a large sheet and separated from a very complete tide table for Boston harbor, covering the whole year, by a modest announcement of the Richard T. Green Co.'s name and business, together with a cut of their shipyard. This kind of advertising should certainly appeal to the boating fraternity and trade.

A Novel Ralaco Demonstration.

A novel exhibit has been seen upon the streets of New York City recently and by means of it the public has been given an opportunity of seeing the well-known Ralaco motor in operation without the necessity of going to the water-front for a demonstration. E. W. Graef, of 136 Liberty Street, New York City, who is the Eastern manager for the company, conceived the idea of placing the regular four-cylinder, 15-20 h.p. motor, which is shown in the accompanying illustration, in place of a 40 h.p. Haynes automobile engine and operating what is practically a boat on wheels. The Haynes car with the Ralaco motor was on duty outside of Madison Square Garden during show week and a large number of people have been interested in the appearance of the car, which includes practically nothing but two seats on the chassis, everything else being open to the public view. The regular type of marine clutch is used and even the throttle and spark levers are left in their original positions. Notwithstanding the fact that the motor weighs 1,375 lbs. and runs with a speed of only 600 r.p.m., the car was easily able to attain a speed of 45 miles per hour and could have done better had the gearing been higher.

Michigan Wheels on Submarines.

The Michigan Wheel Co., Grand Rapids, Mich., have announced that two large propeller wheels have been ordered from them for use on a twin-screw submarine.

A Good Canvas Covered Hull.

B. N. Morris of Veazie, Me., is building a good type of canvas covered motor boat hull in two models. Model A is 20 feet long by 38 inches beam and with a 6-h.p. Palmer motor will make 14 miles per hour. It weighs but 175 pounds without equipment, has a flat bottom with two bilge keels two inches deep to strengthen and stiffen the hull and by using two canoe chairs will carry six people comfortably. Powered as above this hull sells for \$250. The model B has the same length, but is 45 inches wide and will make 14 miles per hour equipped with a 2-cylinder 7-h.p. Fairbanks-Morse motor. This hull weighs 300 pounds unequipped and sells at \$125, or \$325 powered as above. Canvas-covered hulls are less in weight than wooden hulls and the maker claims for them as much strength and greater durability. Then there is the unquestioned advantage of not having to calk leaky seams each season.

A New Motor by a New Maker.

The Brown-Collins Gas Engine Company, 6 Ford Place, Hartford, Conn., is a new concern turning out a 2-cycle engine for marine, electric lighting and stationary use in sizes of from $1\frac{1}{2}$ h.p. to 20 h.p. The marine types are built with an extension base for reverse gear, insuring perfect alignment of the engine and gear and the ignition system is the regular coil and high tension magneto. The new company makes a specialty of light weight canoe motors. B. F. Brown, designer of the well known B. F. Brown motor, is the designer and manager.

Hatch Oil Engines.

The Hatch Oil Engine Company, Brooklyn, N. Y., have been turning out oil engines for nearly ten years and believe they have arrived at a type which can no longer be called experimental. Their engines are made in sizes

ranging from $1\frac{1}{2}$ h.p. to 150 h.p., with one to four cylinders, and the company claims they will operate equally well with kerosene, gas oil, distillate, alcohol, fuel oil and crude oil of suitable quality. They have no carburetor or attachment to vaporize the oil, this being done in the cylinder head with a perfect mixture of air and oil and entire freedom from carbonization. This type of motor is very economical to operate as the consumption of fuel is said to be less than 1-10th gallon per horse-power per hour and repairs are practically a negligible quantity. One customer reported that he had run his boat 120 miles for one dollar, while another makes his engine run printing presses and furnish electric light for 10 hours at a cost of 45 cents. It is claimed that these engines are more safe to operate because they do not use a dangerous fuel and they can be used for any purpose for which a reasonably small power plant is required.

Good Record for Samson Engines.

The Samson Iron Works of Stockton, Cal., has published a letter from one of their customers telling of a towing feat in the Sacramento River accomplished by four boats equipped with Samson motors. The four boats had 165, 125, 75 and 50-h.p. engines respectively and took the dredge Monterey, one of the largest dredges on the coast, up against the current, their engines running continuously for 50 hours. The time made was better than a 500-h.p. steamer made with a smaller dredge.

Kahnweiler Gets Out Tasty Calendar.

David Kahnweiler's Sons, manufacturers of life preservers and jackets, metallic life boats, life rafts, ring buoys, Lyle guns, fenders, cushions, mooring buoys, etc., at 260 Front Street, New York City, have gotten out a very attractive little calendar for 1912. The charming young lady portrayed thereon should certainly have considerable effect in extending the popularity of Kahnweiler's life saving appliances among the motor boating fraternity.

Palmetto Metal Co. Re-Organizes.

The Palmetto Metal Co., Chicago, Ill., manufacturers of the well known Palmetto brand babbit metal, has recently been re-organized and will continue with largely increased manufacturing facilities, together with a greater amount of working capital, so that the company is in a position to successfully extend its operations. The official staff remains unchanged.

A Comprehensive Chart of a Submarine.

The Norman W. Henley Publishing Company, 132 Nassau Street, New York City, have just issued a large chart giving a longitudinal, sectional view of a modern submarine boat. The chart is printed on plate paper and has 200 parts numbered and named with the reference table arranged so that it is but the work of an instant to locate any desired part of the boat. The chart measures 14 x 28 inches and should prove of great value to any one interested in the subject. It is sold for 25 cents, postpaid.

A Veteran Canoe Builder.

J. R. Robertson is one of the veterans of the boat building industry. Since 1881 he has been building canoes and since 1885 has been building them at his present location in Auburndale, Mass., which is certainly a record. J. H. Rushton, of Canton, N. Y., the first man



Vita, Jr., the swift 17 foot 11 inch monoplane built by the Reliance Company for Commodore J. Stuart Blackton, of the Atlantic Yacht Club. She is equipped with a 4-cylinder motor made by Humber, Ltd., Coventry, England.

to manufacture light-weight boats, who attained a wide reputation for this type of craft before his death, gave Mr. Robertson his first information and knowledge of boat building. Mr. Robertson's plant at Auburndale covers 8,000 square feet of floor space and is equipped with the most modern machinery and appliances. Mr. Robertson specializes on canvas covered craft, as he believes that this type has all the advantages and none of the disadvantages of the all-cedar models. Robertson canoes are built in two separate models, the Robertson and the Riverside, the latter being a newer type with very flat floors giving great stability for a canoe. Sponsons are added to any type of canoe while in the course of construction. Besides the canoes, Mr. Robertson builds canvas covered rowboats which have much the same construction, but are built of heavier stock, and canvas covered yacht tenders, having large carrying capacity and well suited for towing. All cedar craft will be built to order only, but will not be carried in stock because of the decrease in demand. Launches will be built either from the owner's design or from designs furnished by Mr. Robertson. Mr. Robertson's long experience and thorough knowledge of the business of building light-weight boats have earned him a well deserved reputation and his products have won him the highest awards in more than one exposition.

A Waterproof Lighting System.

The Electric Goods Manufacturing Company, of Canton, Mass., is turning out a complete, self-contained, high-tension, jump spark ignition system including induction coil, condenser and removable vibrator, all in a single small casing mounted directly on the spark plug, without interfering in any way with the removal and renewal of the porcelain. A new coil winding method makes possible the remarkably small size of this device, 2 inches in diameter and 3 inches high above the plug. Although designed especially for single cylinder engines, it may be used on a larger number of cylinders. One important feature which the company claims for the system is that the containing case is absolutely waterproof. The device sells for \$6 by mail, post-paid. The company also manufactures a current alternating timer which reverses the direction of the current, feeding first a positive and then a negative current to the vibrator at every revolution of the timer shaft, thus preventing deposits of platinum on the vibrator points and overcoming "pitting" and sticking of the points, assuring a good, clean contact.

Rebuilt Cup Defender Aids in Rescue Work.

The schooner yacht Pilgrim, built in 1893 to defend the America's cup, has been bought by Mr. John A. Royall, of Boston, has been overhauled and rebuilt and is at the present time stationed at Beaufort, N. C., engaged in experimental work in connection with the fisheries. The Pilgrim is 128 feet over all, with a 26-foot beam. When she was overhauled, she was fitted with two 4-cylinder, 35-h.p. heavy duty Globe engines made by the Pennsylvania Iron Works Company, Eddystone, Pa. On December 29, 1911, at 8 a. m., while off Cape Lookout Shoals, N. C., she had occasion to respond to the distress signals of the British steamship Thistleroy, bound from Galveston to Liverpool with a cargo of 8,000 bales of cotton and 3,300 tons of phosphate rock, which was ashore in the breakers. The Pilgrim stood by and at the request of the captain of the Thistleroy ran his 5-ton starboard anchor with 15 fathoms of chain shackled with 100 fathoms of steel hawser aboard, and in all the skillful maneuvering required to take this anchor aboard the Pilgrim in a heavy sea, covering, with the subsequent assistance rendered, a period of 48 hours, the Pilgrim held her own splendidly with the revenue cutter Itasca and the wrecking steamer Rescue of the Merritt & Chapman Company. The Pilgrim recently made the run from New York to Norfolk in 30 hours, a distance of 300 miles, under power alone. It goes without saying that Mr. Royall is well satisfied with the performance of his yacht and power plant.

Harpoon II's Long Voyage.

A remarkable trip by a small motor boat was the recent 9,000 mile run of the 23-foot motor boat Harpoon II from Jacksonville, Fla., to Montreal, by the outside route. H. A. and H. J. Dillovan and John DeGrott were the



Schooner Yacht Pilgrim, an old cup defender, now rebuilt. She has two 35-H.P. Globe engines.

daring young mariners who made the trip and they were received with every courtesy and lavishly entertained by practically all of the power boat and yacht clubs along the coast, besides being made honorary members of many of them. The little vessel was equipped with a Fairbanks-Morse 2-cylinder, 7-h.p., type E marine engine.

Frenchman Invents an Unsinkable Boat.

Joseph Pasterel, who claims the Republic of France as his native country, but at present lives in Asbury Park, N. J., has patented an unsinkable boat which has some interesting features. The frame work is made of hard rubber covered with sheets of rubber cloth in such a way as to form a number of independent air-tight compartments which can be inflated to increase the buoyancy of the boat. The elasticity of the materials employed enables the structure of the boat to sustain severe shocks without injury. The entire frame work of the hull may be moulded in one piece for small craft or made in sections for larger vessels. In addition to the independent air compartments, an elastic tube may be run around the boat, secured to the frame work or hull at the level of the gunwale. This may be inflated to increase the buoyancy of the boat and aid in balancing. The motive power may be supplied by an ordinary motor, or it may be used as an ordinary sail or rowboat.

A Good Lubricating Oil for Motor Boats.

The Havoline Oil Company, of New York City, acting on the theory that nothing is more essential to smooth running, speed and life of the marine motor than proper lubrication, has gone scientifically into the subject of the real needs of marine engines in the matter of oiling. Its extended facilities, including four immense refineries, besides laboratories and test stations, in charge of practical lubrication engineers of many years' experience, has enabled it to produce a motor lubricating oil that has earned a wide reputation for quality and general efficiency. Not only has this oil been used in many of the winning motor boats of the past season, but Capt. Larsen used it on his dangerous trip through the rapids of Niagara.

G. H. Simpson to Handle Ferro Advertising.

Mr. G. H. Simpson has just been appointed advertising manager for the Ferro Machine & Foundry Company of Cleveland, Ohio.

State Engineer's Department Issues Interesting Map of New Barge Canal.

No. 12 of series 4 of the Barge Canal Bulletin issued by the Department of the State Engineer and Surveyor of New York, besides the reports on the progress of the work, has as a supplement a very interesting bird's-eye view of the canal showing the topographical features of the country through which it passes. This waterway extends from Buffalo to Troy, N. Y., practically following the route of the Erie Canal and its connections with Lakes Erie and Ontario, as well as the small bodies of water in the lake district of New York State are well shown by this map.

Users Like Automatic Engines.

A good index of the worth of an engine is its reputation among people who have bought it and it is on this fact that the Automatic Machine Company, of Bridgeport, Conn., base to a large extent their claims for their marine motors. In fact, the company urges prospective buyers to ask someone already using the Automatic engine what his experience has been with it before finally deciding on the purchase. Simplicity of design not only makes for efficiency in the Automatic, but makes quick repairs possible in case of a breakdown. The company keeps a record of every engine sent out and any part can be supplied by the factory immediately upon receipt of a telegram or other notification. The makers have records on file of noteworthy performances by their motors, as, for example, one 2-cylinder engine which is four years old, has run over 47,000 miles and has had just \$10 spent on it for repairs during that time; also an 18-h.p. 3-cylinder 5½ x 7 motor which ran 24 hours on 40 gallons of gasoline. These engines are built in sizes of from 3 up to 300 horse-power.

"Watch Their Record."

The Rex Motor Company, 220 Devonshire Street, Boston, Mass., are starting out to make a large place for themselves in the gasoline engine industry. They have begun on the theory that a limited manufacturing output, personally supervised, with careful attention to details is the secret of a marine engine of high quality. The Rex engine is a two-cycle machine built in 5-7 h.p. one-cylinder, 10-14 h.p. two-cylinder, 15-21 h.p. three-cylinder and 20-30 h.p. four-cylinder sizes. The cylinders are cast in one size only, 4½ x 5 inches. These sizes the Rex people believe are the most in demand, and by confining themselves to just these four they can not only turn out a better motor, but do it more cheaply, as they do not have to carry the cost of patterns and machinery for a large number of models that are seldom wanted. The three and four-cylinder sizes are built to order only. The engine is of the jump spark, combination 2 and 3 port type and can be started by simply rocking the flywheel. The cylinder head is water cooled and detachable and the pump is of the rotary pattern, giving an even supply of water. Rex engines are sold under a cast iron guarantee for the life of the engine and the company agrees to replace free any engine or parts not exactly as represented, besides paying transportation charges.

Cleveland Supply House Moves into Larger Quarters.

The Motor Boat and Supply Company, previously of 1516-20 Columbus Road, Cleveland, Ohio, have moved into their new location at 1411-15 West Ninth Street, corner of Frankfort Avenue. This will give them increased facilities for the proper display of their line of boats and engines as well as their large stock of marine hardware and accessories. The company will shortly issue its new catalogue supplement and discount sheet and will be glad to send a copy of the same to anyone interested in motor boating.



14-foot hydroplane designed by Mr. John Hacker, of Detroit, Mich., powered with a 6-h.p. Gray motor. This boat was exhibited at the New York show.

Additional Exhibits at the New York Show.

The Regal Gasoline Engine Co., Coldwater, Mich., showed a representative line of their marine engines. Regal motors are of the four-cycle type and are built in sizes of from 3 to 16 h.p., with from one to four cylinders in the light-duty design, in 5, 10 and 24 h.p. sizes in the medium-duty models, and a heavy-duty line developing from 7 to 45 h.p. In addition to this regular line, the Regal people are making this year a 32 h.p. automobile marine engine for speed boats. The light-duty engines for 1912 have been altered to take a manifold similar to the one used on the medium and heavy-duty machines. Minor changes have also been made in lubrication, cam design, timing, etc. The new members of the Regal family, which have appeared during the past year, are the 3 h.p. single-cylinder, 6 h.p. two-cylinder and 12 h.p. four-cylinder light-duty models, besides the marine automobile engine mentioned above.

The Xargil Mfg. Co., Utica, N. Y., were located in section A on the main floor, where a number of single and double-cylinder marine motors and a couple of small stationary engines were shown. These engines can be run on kerosene as well as gasoline by means of a special system, whereby just the amount of fuel necessary for each explosion is lifted and delivered automatically into the explosion chamber. The engines are of the two-cycle, four-port type, two of the ports being used for the air supply. The company also showed an interesting muffler for marine use, which effectually exhausts the gas without producing back pressure.

The Erd Motor Co., Saginaw, Mich., exhibited with the Gasoline Engine Equipment Co. Their special "Featherweight" high-speed line was shown in a 20 h.p. two-cylinder, 30 h.p. three-cylinder, 40 h.p. four-cylinder and 60 h.p. six-cylinder. The standard type two-cycle motors were shown in 5 h.p. single-cylinder, 7 h.p. double-cylinder, 10 h.p. double-cylinder, 12 h.p. three-cylinder and 15 h.p. three-cylinder sizes. A 24 h.p. four-cylinder, four-cycle, medium-speed, heavy-duty motor was also included in the display. The Erd special "Featherweight" motors are receiving a great deal of the company's attention this year with the result that a large number are coming East to be installed in fast runabouts and speed boats.

The Grimm Mfg. Co., Buffalo, N. Y., exhibited at the show in space No. H, where two, four and six-cylinder motors were shown. These engines were of the four-cycle type with a bore of $3\frac{1}{4}$ inches and stroke of $4\frac{1}{2}$ inches and developing 6-8, 12-16 and 18-25 h.p. respectively. A one-piece crankcase is used giving a very rigid and practically oil-tight construction, besides making the parts very accessible. The crankshaft can be removed by simply disconnecting the connecting rods and removing the bearing head without disturbing the cylinders, pistons, water piping, oiling or wiring systems. Grimm motors for 1912 have a bronze water pump and brass piping, making the outfit particularly well suited for salt water use. Water-cooled exhaust manifolds and force-feed oilers are used. The ignition employed is the jump-spark system in connection with a K-W high-tension magneto. The Grimm Mfg. Co. is represented in New York by the Waterloo Gasoline Engine Works, 137

Liberty Street. In addition to the engines a reverse gear which the company have recently placed on the market was also shown.

The Fulton Mfg. Co., Erie, Pa., exhibited a complete line of their marine engines in space No. X2. Motors were shown in $3\frac{1}{2}$, 5 and $7\frac{1}{2}$ h.p. single-cylinder, and 7, 10 and 15 h.p. double-cylinder sizes. This company was the first to adopt the Wico self-sparking system of ignition and this year they are building engines with this system only. Last season engines were built with both the Wico system and make-and-break ignition, but the small demand for the make-and-break type decided the company to abandon this form of ignition for 1912.

The Atwater-Kent Mfg. Works, Philadelphia, Pa., had their display in the balcony where their "Unisparker" ignition system was shown. This device has been in use for over five years and embodies the best features of both magneto and battery without the weak points of either. A type suitable for marine work was shown with a waterproof cap. In addition to the ignition device, the "Monoplex" marine horn was shown for motor boats. This is an electric signal operated by a push-button and works on the vibrator principle.

The Loew Mfg. Co., Cleveland, Ohio, showed the Loew Victor motors in different sizes on the main floor. The 1912 models of these engines have several improved features one of which is a specially designed reverse gear and disc clutch on the four and six cylinder types. A Bosch high tension magneto is used as well as Connecticut igniters and Bosch coils, spark plugs and cables, giving two separate ignition systems operating entirely independently of each other. Besides the splash lubrication, a supplementary mechanical oiler is used thus providing a very thorough oiling system. A rotary pump has been substituted for one of the plunger type and the engines are made with an extended base carrying the gear and clutch. These motors are of the four cycle type and are made in sizes of from one to six cylinders developing from 6 to 60 h.p. A kerosene engine is also made in corresponding sizes.

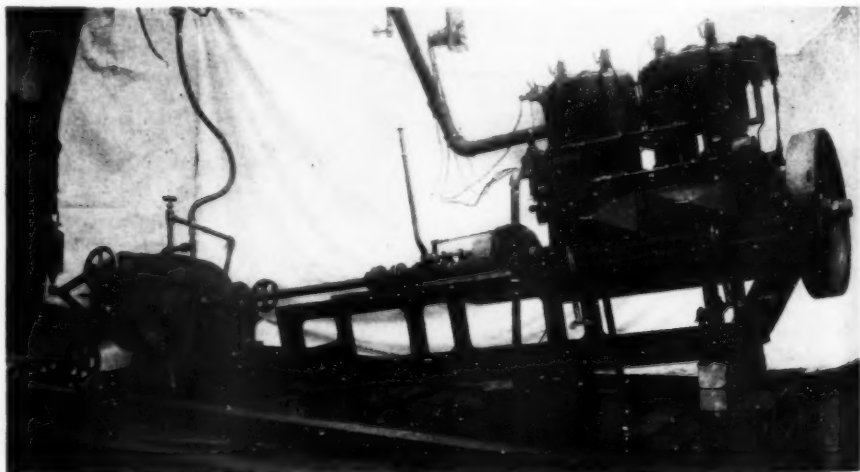
The Morton Motor Co., Detroit, Mich.,

distributors of the Kermath four cylinder, four cycle motor made by the Kermath Mfg. Co. of Detroit, exhibited on the main floor. This engine is made in one size and type only, with cylinder $3\frac{1}{2} \times 4$ inches and the large output enables the manufacturer to put it on the market at the low price of \$150. The engine develops 10-12 h.p. at a speed of 800 to 1000 r.p.m. The oiling system is by the splash system with an auxiliary plunger pump connected to the cam shaft. A rounded bowl forms the bottom of the crank case under each cylinder with an oil reservoir at the after end and a sight feed oil gauge on the forward cylinder. The oil flows through the crank case into the reservoir, being maintained at constant level in each of the bowls.

The S. M. Jones Co., Toledo, Ohio, exhibited Ralaco engines in two and four cylinder sizes, developing 8-10 h.p. in the first size and 15-20, 25-30 and 45-50 h.p. in the four cylinder models. One of the noteworthy facts concerning these engines is that there have been no changes made in them this season, the makers believing that they have produced an engine as nearly perfect as it can be made. Ralaco engines won the New York-Albany race, 235 nautical miles, in the cruiser division, the Block Island power boat race for the Day challenge trophy, 100 nautical miles, besides other contests of less importance. An interesting and useful little souvenir in the shape of a propeller pitch finder was distributed at the Ralaco space. Another part of the exhibit, not located in the Garden, was a Haynes motor car in which a 15-20 h.p. Ralaco motor was installed. This novel demonstration is more fully described in the Yard and Shop section of this issue.

The Van Blerck Motor Co., Detroit, Mich., exhibited in the space of the Gasoline Engine Equipment Co., where a two-cylinder 15 h.p., two four cylinders developing 40 and 60 h. p., respectively, two six cylinders developing 48 and 94 h.p., respectively, and a twelve cylinder rated at 240 h.p. were shown. One of the six cylinder machines was equipped with a compressed air self-starter designed and made by the Van Blerck Motor Co. The twelve cylinder, a huge machine, is designed for a 26-footer now being constructed by Adolph Apel. Van Blerck motors are of the four cycle type with T head cylinders, made with a cast iron water jacket in the medium duty models and an open water jacket covered with a brass plate in the high speed types. A mechanical force feed oiler is used for lubrication to which a force pump is added on the high speed engines. The Bosch ignition system is used.

The Lackawanna Mfg. Co., Newburgh, N. Y., exhibited representatives of their line of marine motors besides a sectional engine and an electric lighting plant, on the main floor. Lackawanna motors are reversible and made in a large number of sizes from 1 to 6 cylinders developing from $2\frac{1}{2}$ up to 55 h.p. The entire line with the exception of the 6 cylinder 45-55 h.p. model was shown. These engines are distinguished by their simplicity and few working parts and a number of improvements have been incorporated in the 1912 models, including the newest type of Hydrex silencer, Schebler carbureter, improved bronze circulating pump driven from the main shaft, automatic oiling system, etc.



Testing out the oiling system of the new 25-35-h.p. Sterling motor. The engine is running at an angle of 10 degrees.

The New York Motor Boat Show.

(Continued from Page 30.)

The Mercury Motor Company, which has its works in Long Island City and its office in the Produce Exchange Bldg., New York City, exhibited a large line of its 1912 four-cycle motors. These included 6, 14, 25, 40, 52 and 60 h.p. sizes and a 100 h.p. six-cylinder engine. The company also exhibited for the first time their 200 h.p. "Silent Mercury." This engine is extremely light, considering its power, as it weighs but 695 lbs. complete. The cylinders have a bore of 7½ inches and a stroke of 7½ inches. The motor is 24 inches long and of the V type. Mercury engines have taken a prominent place in speed boat racing, having been installed in the following well-known boats: Peter Pan I, II, III and IV, Peter Pan Jr., Reliance, Pegasus, Hello, Tinker Bell, Wolf, the Western champion, Gunfire I and II, Gunfire Jr., Marijan, Runabout II, Three Twins and others.

The Bridgeport Motor Co., Inc., Bridgeport, Conn., had a large display of their marine engines in block W. In the single-cylinder style were shown a 2½ h.p. 3½" x 4" motor, a 4 h.p. 4½" x 5", a 5 h.p. 5¼" x 5", a 7 h.p. 5½" x 5½" and a 9 h.p. 6½" x 6½". The two-cylinder line comprised an 8 h.p. 4½" x 5", a 10 h.p. 5¼" x 5", a 14 h.p. 5½" x 5½" and an 18 h.p. 6½" x 6½". Model No. 270 was the only representative of the three-cylinder class. This engine had a bore and stroke of 6½" and developed 27 h.p. In addition to the foregoing motors, three special semi-speed models were shown, model C, a 6-8 h.p. two-cylinder 3½" x 4" engine, model B, a 10-12 h.p. 4½" x 5" engine, and model E, a 15-20 h.p. three-cylinder 4½" x 5" machine. All 1912 Bridgeport motors have a split base cylinder with extra large base hand hole plates and detachable cylinder heads. The Bridgeport 2 and 3-port fuel admission system is retained and the Schebler carburetor supplied as part of the engine's equipment. The make-and-break type of ignition is used, with movable igniter and adjustable lead. The Bridgeport vapor rectifier is furnished this year, which provides a perfectly uniform mixture under all conditions with an extremely wide range of speed control and economical fuel consumption. This device also prevents backfiring or base explosions.

The Jencick Motor Corporation, of Port Chester, N. Y., exhibited three of their high-speed engines in block G. These were a four-cylinder, four-cycle 4½ x 5 in., a six-cylinder 5 x 5½ in. and a six-cylinder 7½ x 7½ in. The 7½ x 7½ in. motor is equipped with a self-starting mechanism of a simple, safe and sure form and also has an air compressor which is so arranged that it can be disconnected by hand or automatically. The maximum pressure used for the starter is 250 lbs. per square inch. The air is stored in a pressed steel tank 12 x 48 in., which has sufficient capacity for 15 separate starts. The starting valve, pressure gauge, speed indicator, oiler for the cylinders and the oil gauge for the base are all within easy reach and view of the operator. Jencick motors have Hess-Bright ball bearings on minor bearings. Working parts are made of Krupp chrome nickel steel and the main and connecting-rod bearings of Parson's white bronze. A G. and A. carburetor and the Bosch dual ignition system are used.

The New York Yacht, Launch & Engine Company, Morris Heights, New York City, had their exhibits on the main floor in Block H, near the entrance. There they displayed one of their Twentieth Century six-cylinder motors. These motors are built in the following sizes, for every requirement of the motor boat enthusiast: Two cylinders, 12-16 h.p., 5¼ x 7¼ inches; three cylinders, 18-23 h.p., 5¼ x 7¼ inches; four cylinders, 24-30 h.p., 5¼ x 7¼ inches. The above are designed to run at 400 r. p. m. Four cylinders, 30-40 h.p., 6½ x 8½ inches, and four cylinders, 50-65 h.p., 8 x 10 inches, both running at 350 r. p. m.; and six cylinders, 45 h.p., 5¼ x 7¼ inches; six cylinders, 65 h.p., 6½ x 8½ inches; six cylinders, 100 h.p., 8 x 10 inches. These engines are also to be run at 400 r. p. m. During the motor boat show the company had several different size engines running under load in their testing house at Morris Heights, which they exhibited to prospective customers and explained more fully the merits of the Twentieth Century engine.

Fairbanks, Morse & Co. exhibited each of their different types of marine engines, together with sectionalized parts and an engine sectionalized and operated by an electric motor, so that all working parts could be inspected by interested visitors. The Fairbanks-Morse type E is the baby of the family in the 3½ h.p. size, having a single cylinder 3¼ x 3¼ in. and is especially adapted for small boats. This engine was also shown in a 7 h.p., two-cylinder size, making a lightweight, high-speed machine for pleasure boats and light runabouts up to 20 ft. The type G line was represented by 1, 2, 3 and 4-cylinder engines, developing 6, 12, 18, and 24 h.p. respectively. All except the single-cylinder engine of this type are regularly fitted with Delco ignition or timer and coils. This is the regular Fairbanks-Morse line as built for the past two seasons, except for a few added features. An innovation was found in the new type K engines, consisting of a one-cylinder 7½ h.p. 5½ x 6 in. motor and a two-cylinder developing 15 h.p. at 550 r.p.m. This engine has make-and-break ignition, plunger pump, and manifold combining intake and exhaust hot-air adjustments to carburetor. The water is by-passed to and from the head through outside water connections. Lubrication is by the gravity system or through the carburetor. It is claimed that these engines will operate successfully on low-grade fuel.

The Motsinger Device Mfg. Co., which has its main office and factory at LaFayette, Ind., had its display in space No. 42, where, as the main feature, was shown a boat lighting and ignition system. This system is designed to be perfectly reliable and as simple as possible, without detracting from its efficiency, and with this in view all costly fittings have been left out. The system was shown in operation so that anyone interested in motor boat lighting and ignition could see just how it worked and judge to better advantage what he was getting for his money. Along with the complete plant, the popular Motsinger D. C. 15 magnet magneto was shown. The company states that contracts have been let for three thousand of these magnetos by different engine manufacturers.

C. F. Roper & Co., manufacturers of marine specialties, Hopedale, Mass., exhibited their line in space No. 35 in the balcony. The exhibit consisted of Roper reversing propellers, marine speedometers and the Roper safety coupling. The Roper propeller makes possible a one-lever speed control in any motor boat, allowing any speed from standstill to full speed forward or backward without any adjustment of the engine and without allowing it to race. For 1912 the prices of these propellers have been reduced about 25%, making the equipment no more expensive than a good reverse gear and propeller outfit. The marine speedometer is a 1911 product which proved enough of a success to give it an assured place among motor boat accessories. Two minor changes have been made in the instrument for 1912, increasing its reliability and accuracy. The Roper safety coupling is a device which is designed to protect propeller wheels from injury when striking a rock or other obstruction, by shearing off, thus freeing the propeller from the engine and cutting off the power. The price is \$10.

The Texas Co., 17 Battery Pl., New York City, and Houston, Texas, exhibited in spaces 1 and 2 in the concert hall, where samples of Texaco motor oils in light, medium, heavy and extra heavy grades, transmission lubricant, cup grease, etc., were shown. Texaco oils have a zero cold test and are guaranteed not to congeal above that temperature. This makes them well suited for cold weather work, since the user need not be afraid of his oil freezing in the feed pipes and interfering with the work of the motor. They have a somewhat lower flash point than the average motor oil and burn up completely in the combustion chamber, passing out with the exhaust gases without leaving any hard carbon deposit in the cylinder or on the spark plug. Being somewhat heavier in body at ordinary temperatures than most other motor oils, there is better lubrication of the bearings and the film around the piston rings in the engine helps to main-

tain high compression. Texaco motor oil is sold in one and five gallon cans with a special pouring spout and a seal that must be broken before any of the oil can be removed.

The Hartford Suspension Co., Jersey City, N. J., exhibited their lighting and starting device for use on motor boats in the balcony. The Hartford system is a combination of a small dynamo, storage battery and automatic cut-out switch for lighting, to which is added a small motor with suitable gears for starting, the whole having a weight of not over 35 lbs. As the motor is only used a second or two at a time when starting, it should last indefinitely. The generator can be located at any convenient point where the lighting generators are placed at present, generally connected to the pump shaft of the engine with a reduction of about 2 to 1. A combination magnetic cut-out and lighting switch is the only complication in the mechanism. The Hartford Company have been trying out this system for over a year and a half, and it has given excellent satisfaction.

The E. J. Willis Co., 85 Chambers St., New York City, exhibited on the main floor. Here were shown samples of the "Toledo" motors made by the Universal Machine Co., Bowling Green, Ohio, and the Baldrige reverse gears, made by the Baldrige Gear Co., Toledo, Ohio. The Yankee Company's (Utica, N. Y.) line was represented by the Yankee power whistle and Yankee mufflers, as well as representatives of the famous speed propellers, made by the Bryant & Berry Company, of Detroit, Mich. The Roper reversible propeller also had a place in this exhibit as well as many other styles and types of marine hardware, made by a number of different manufacturers.

Janney, Steinmetz & Company, Philadelphia, Pa., occupied space in the balcony, and had as a feature of their display a complete installation of their marine engine starter and whistle pump, showing the method of attachment and the working of the outfit in actual service. Representing their regular products were specimens of various types of marine air compressors and a full line of their seamless steel, tinned gasoline and air-pressure tanks. These tanks are made of cold drawn seamless steel, tinned with pure block tin and tested to 300 pounds hydrostatic pressure per square inch, thus practically eliminating any chance of leakage.

Chas. P. McClellan, Fall River, Mass., displayed his line of boat tops, spray hoods, etc., in the balcony. McClellan makes a popular style of auto boat top, in which he has incorporated a number of special features for the season of 1912, all tending to make it easy to operate, comfortable and safe. Besides the boat tops, he offers combination and melon spray hoods in styles and sizes to meet every requirement of the user and all types of boats, as well as cockpit covers, boat cushions, yacht ensigns, fenders, pillows, tents and the well-known McClellan bed hammock. McClellan products are in use on government craft, both at home and abroad, and find favor with the leading naval architects and yacht builders.

C. F. Splitdorf, of New York, the magneto maker, had an interesting exhibit in the balcony. A sectional view of the model F low-tension magneto was shown, with the armature, distributor and circuit-breaker in full view so that the visitor could see for himself exactly how a magneto works. There was also a working model of one of the largest magnetos ever made, weighing 800 lbs. and standing nearly 4 ft. high. All the low-tension models were on exhibition as well as the new "Gem" coil and the well-known Splitdorf spark plugs. The improvements which are to be made on the low-tension models this year are chiefly in interior design and insulation.

The Tucker & Carter Rope Company, 76 South Street and 167 Maiden Lane, New York City, showed samples of their tiller rope in space No. 59. This rope is made from flax yarn with a bronze center, and in addition to specimens of the completed rope, the company had on exhibition samples of the flax hemp yarn from which the rope is made, the yarn after being waterproofed, and the bronze rope core.

The Electric Goods Mfg. Co., Canton, Mass., had their Perfex ignition device on exhibition and also demonstrated its waterproof qualities by showing it sparking in water and while being continually drenched by a fine spray. The Perfex is a complete, self-contained, high tension, jump spark ignition system, including induction coil, condenser and removable vibrator, all contained in a single small casing which is mounted directly on the spark plug. The remarkable feature of this system is its small size, the entire device being but 2 inches in diameter and 3 inches high above the spark plug. This is made possible by the unique coil winding method employed by the makers. The Perfex used on the Seabird during her ocean trip formed part of the exhibit and one of the early forms of this device, made in 1905, was also shown. The Perfex system is employed on submarines powered with a 6-cylinder, 250 h.p., jump-spark motor.

The Wolverine Lubricants Co., 80 Broad St., New York City, showed samples of their "Wolf's Head" oil in the concert hall. The oils were shown in cans of various sizes and glass tubes lighted by electricity. The Wolverine people have some very interesting letters commending their product, not the least of which is one from the owner of the Dixie IV, which will use this lubricant in the coming racing season.

Chas. H. Gillespie & Sons, Jersey City, N. J., who have made varnish for almost a century, exhibited their line of enamels and varnishes suitable for marine use, including Monarch spar varnish, Monarch elastic floor and deck finish and Monarch yacht white enamel, in their booth on the balcony. In addition, their Bull Dog paint and varnish remover was shown and its efficiency practically demonstrated. Monarch products have been adopted by several of the leading coastwise steamship lines as well as by the New York Central Railroad, for its floating equipment. An interesting little booklet entitled, "A Treatise on Refinishing Yachts and Motorboats," was distributed free to visitors at their booth.

W. & J. Tiebout, 118 Chambers St., New York City, had their extensive line of marine hardware, including lights, bells, cleats, flag sockets, hinges, etc., neatly arranged according to size on large display boards in their booth on the balcony. In the front of the booth was shown a Star air pump and whistle outfit, as well as one of the pumps in section. Air whistles of various sizes were also shown.

The Roberts Motor Co., Sandusky, Ohio, showed a representative line of their marine motors on the main floor. The display included a 3 h.p. single-cylinder, 6 and 10 h.p. double-cylinder, 30 h.p. three-cylinder, 20 and 40 h.p. four-cylinder and a six-cylinder 70 h.p. $4\frac{1}{2} \times 5$ -inch engine. A sectional single-cylinder model "O" was also shown which attracted quite a little attention. The Roberts Motor Co. have a special alloy, known as "aerolite," which they use in the cylinders of their high-speed engines. This metal is as light as aluminum and is stronger than cast iron, besides having better wearing qualities than either cast iron or steel. Another interesting feature of Roberts motors is the Roberts double-ignition system, combining any of three battery outfits with a high-tension Bosch magneto in such a way that the motor can be operated either on the battery or on the magneto or on both, as may be desired.

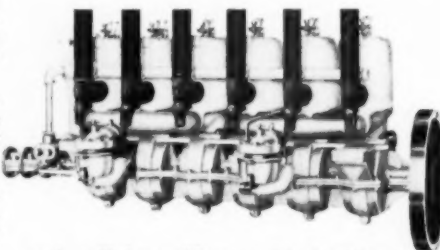
The Cape Cod Power Dory Co., Wareham, Mass., exhibited a 20-foot special smooth-planked motor dory, powered with a Palmer engine, a 10-foot cedar rowing skiff and one of their new 16-foot sportsman's fishing boats. The 20-footer has its engine in a small cabin in the stern where it is thoroughly protected from weather and salt water but easily accessible at any time. The rowing skiff was a really remarkable little boat for \$20. Its construction makes it especially suitable for ladies' and children's use, as it is perfectly seaworthy and safe. The equipment includes anchor, oars, rope and oarlocks. In addition to the boats, a bilge pump was shown capable of discharging 12 gallons a minute and a large relief map of Cape Cod, a duplicate of the one used on the company's literature, with the different lighthouses indicated by small electric lights.

Gus A. Diem, 20 Fulton St., New York City, showed a line of yacht plumbing and fittings in the balcony. In the front of the booth was shown a complete outfit comprising water closet, basin and pump. One of the advantages of

these outfits is the ease of installation, no expert workman being required to put them in a boat. Another feature is the improved form of sea valve used, which gives the full area of the discharge outlet and is absolutely protected against flooding. The exhibit also included different styles of brass and copper ventilators, including the new semi-hammered ventilator, priced at \$5.50, as well as port lights from three inches up, for boats of all sizes.

The Waltham Watch Co., Waltham, Mass., had a very attractive display of their timepieces for marine and land use in their booth in the balcony. One of the attractions of the display was their box chronometer. This time-piece is constructed so as to maintain a horizontal position when the boat is rolling and pitching. The movement is carefully adjusted and a red disk indicator on the dial appears when it is time to wind the chronometer. For those who did not wish a regular box instrument, eight-day timepieces were shown in water and dustproof casings which could be attached to the bulkhead of a boat. A feature of the exhibit was a watch movement enlarged 100 times which was displayed at the front of the Waltham space in a glass case. In the same case, by way of contrast, was a specimen of the smallest watch manufactured by the company. Some beautiful examples of small watches with jeweled cases were also shown.

The Richardson Engineering & Mfg. Co., Hartford Conn., showed interesting lighting outfits, searchlights, etc. Brown motors were also on display in $1\frac{1}{2}$ h.p. single-cylinder, 3 h.p. double-cylinder and 16 h.p. four-cylinder sizes, the last being new this season. A lighting set was shown complete with a Peerless dynamo and switchboard connected to a two-cylinder engine. A switchboard was also shown with



70 h.p. Roberts Motor, with Aerolite cylinders. Total weight, 385 pounds.

a new type of circuit-breaker which works automatically and does not heat. A line of arc searchlights were in the display which were so constructed that the light could be turned completely around any number of times or lifted from its stand without disturbing the electrical connections.

The Stanley Co., Boston, Mass., showed their two-cycle, two-port marine motors in the following sizes: Single-cylinder, 3 h.p. and $7\frac{1}{2}$ h.p., and two-cylinder, 6 h.p., 14 h.p. and 15 h.p. The $7\frac{1}{2}$ h.p. single-cylinder is the new model for this season. Features of Stanley marine motors are found in the forged and tapered shaft, the location of the check valve on the hand-hole plates and the use of nickel steel plugs. Another advantage which these engines possess and which has made them a popular type among oystermen, is their ability to run at very slow speeds. These motors are made with make and break ignition in all but the 7 and 14 h.p. sizes and lubricate by mixing oil with the gasoline.

The Thermex Silencer Works, East Boston, Mass., showed their odorless, free exhaust silencer in different sizes and their stream ejector underwater exhaust. A silencer in section, showing the construction was also exhibited. The Thermex Silencer employs an umbrella-shaped deflector which mixes circulating water from the engine with the exhaust gases, reducing their temperature and volume, and precipitating solid matter in the bottom of the expansion chamber, whence it is drained off.

The Evans Stamping & Plating Co., Taunton, Mass., showed their Paragon reverse gears in the balcony. A nickel-plated gear was set up for exhibition purposes besides a disassembled gear to show the construction. In addition, a high-speed racing type of Paragon gear was shown weighing 80 lbs. and capable of taking 100 h.p. at 1,000

r.p.m. Paragon gears are made in 11 different models for every size of engine.

The Milton Boat Works, Rye, N. Y., had their exhibit in space 24 in the balcony, where a Patterson trap ventilator for motor boats was demonstrated. This device is so constructed that air is admitted freely and at the same time driving rain or spray is trapped and carried out on deck. An adjustable device regulates the amount of air admitted by the ventilator. The Patterson is made in three stock sizes of either brass or galvanized iron. Blue prints of racers, runabouts and cruisers built by the Milton Works were also available for those interested.

The Snow & Petrelli Mfg. Co., New Haven, Conn., showed different sizes of Joe's high power reverse gears, including a mounted gear partially cut away to show the mechanism and a disassembled gear. These gears are made in all sizes for motors up to 150 h.p. They have been worked over and developed for six years and in the 1912 models have spur gears substituted for the eccentric in the gear train for the reverse motion.

John C. Hopkins & Co., 119 Chambers St., New York City, showed a line of marine hardware comprising galvanized and brass lights, life preserver cushions, etc. A Waterbury wireless dry battery holder containing six cells of different makes was shown as well as a line of magnetos made by the Hendrix Novelty Co. Hopkins is also agent for the Mechanical Devices Co. of Watervliet, N. Y., and samples of their specialties including flexible pipe joints, couplings, etc., formed part of the display.

The Havoline Oil Co., whose products are distributed by the Indian Refining Co., of New York City, had samples of their oils and grease in their booth on the balcony. An absolutely clear crystal oil was one of the interesting features of the exhibit. In front of the booth were a number of framed testimonials from enthusiastic users of Havoline motor oils. This brand of lubricant was used by Capt. Larsen in his trip through the Niagara Rapids. The Company distributed at the show a clever little leaflet of "Perverted Proverbs," for the correct solution of which a large can of Havoline oil was offered as a prize.

The Aaron Automatic Bilge Pump Co., Providence, R. I., had a very practical demonstration of the advantages of their pump on the main floor. The makers of this device claim that it will not only pump out all water in the bilge but draw up the gasoline fumes as well, thus preventing the risk of fire or explosion. This was demonstrated by pouring gasoline into a tub full of water which was then pumped into another tub and a match being held at the outlet of the pump, the gasoline fumes passing out with the water became ignited, thus proving conclusively that these fumes are actually drawn off. The pump works on the vacuum principle and has already been taken up by the engineering and navy departments of the government as well as by several large owners of oyster fleets.

The Eagle Co., Newark, N. J., whose New York branch is managed by Bruns, Kimball & Co., exhibited 10 models of their engines on the main floor. Four high speed models were shown and 9 medium duty as well as 5 heavy duty machines and 1 stationary engine. The high speed, three port engines were new models and had the water circulation system arranged so as to eliminate piping. An unusually complete equipment goes with every Eagle engine including Schebler carbureter, complete ignition outfit, Hyde propeller, etc. Eagle engines are arranged to lubricate through the gasoline.

The Reynolds Motor Co., Detroit, Mich., exhibited a four cylinder 15-20 h.p. and a six cylinder 30-35 h.p. and had one of the four cylinder models in section to show the working parts. The 30-35 h.p. has in reality seven cylinders, the central one being a dummy through which the vertical drive shaft is brought thus balancing the drive and minimizing back lash. Ignition is by a dual high tension magneto for which a metal housing is provided and waterproof spark plugs are supplied so that the running of the motor will not be affected by spray or rain. This engine has a bore of $4\frac{1}{2}$ inches and a stroke of 6 inches developing 30 h.p. at 650 r.p.m. and 35 h.p. at 1000 r.p.m. Both the four and the six cylinder machines have rotary valves and operate on the four cycle principle.

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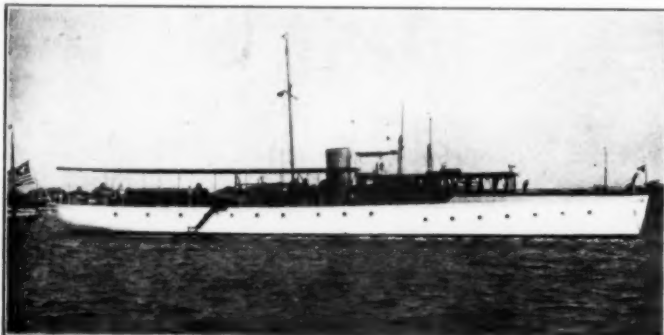
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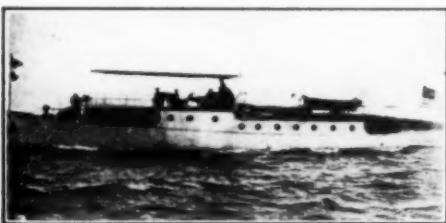
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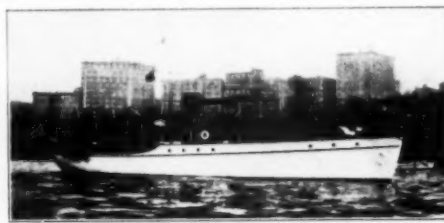
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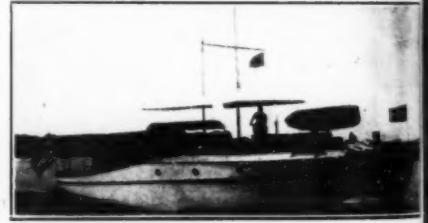
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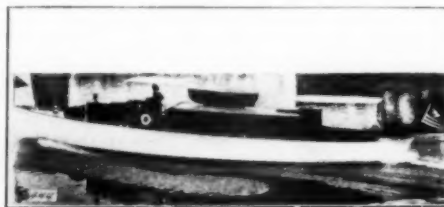
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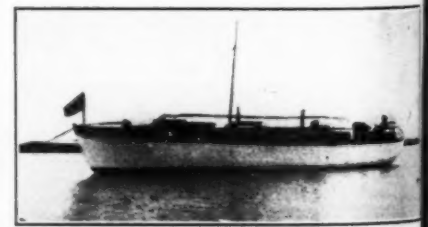
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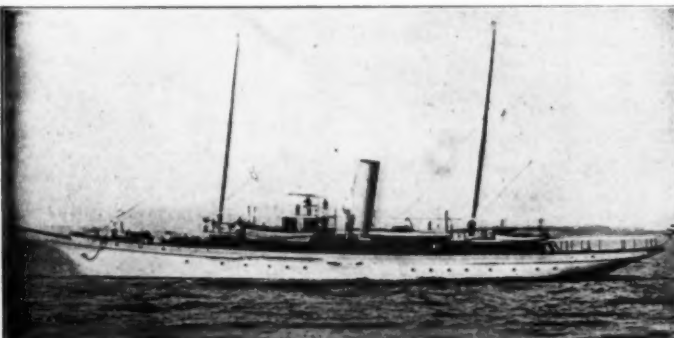
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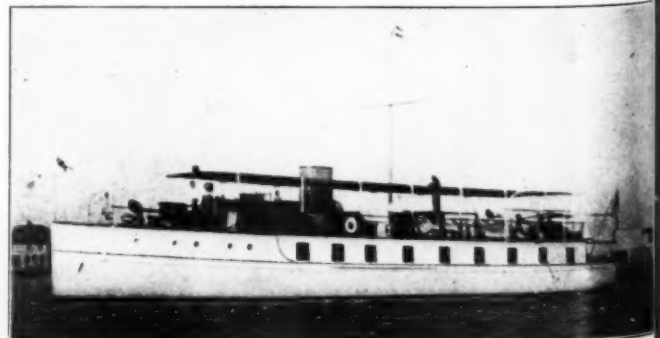
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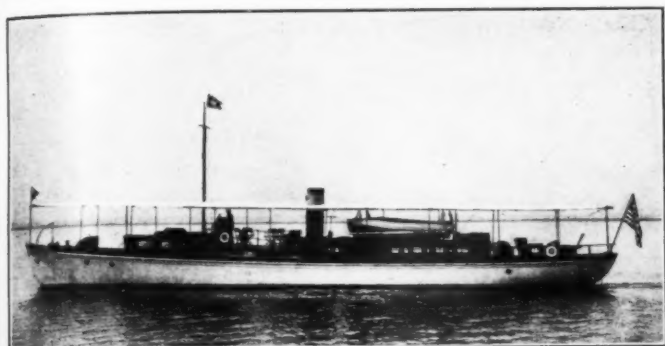
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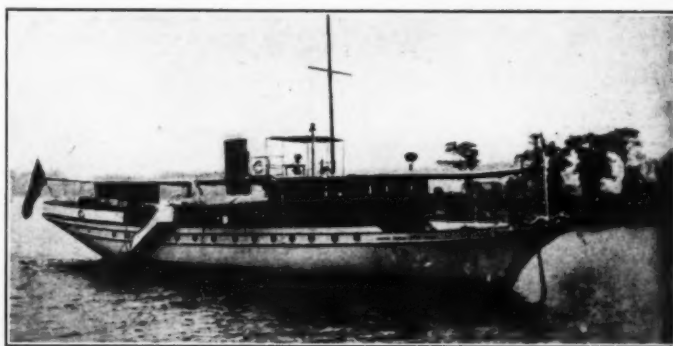
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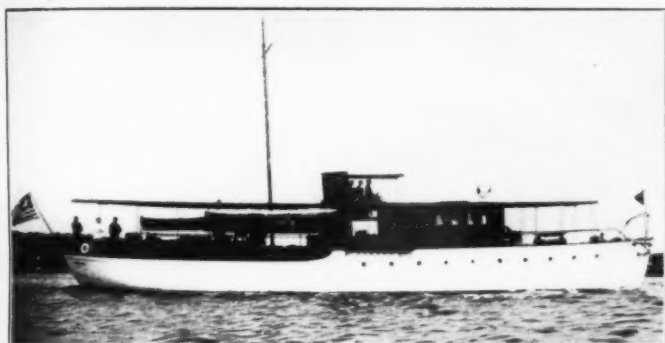
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No. 6411.—An Exceptional Coast Cruiser with speed of 15 miles. 93 x 13½ x 4½. Two 100 Stanjards. Electric lights. Owner's double stateroom forward with bath and toilet adjoining. Fifteen foot saloon aft with 4 Pullman berths. Interior finest mahogany. Engine compartment amidships between watertight bulkheads. Galley full width. Complete equipment. Perfect condition. Cost \$35,000. Having larger boat, owner solicits immediate offer. Stanley M. Seaman, 220 Broadway, New York.

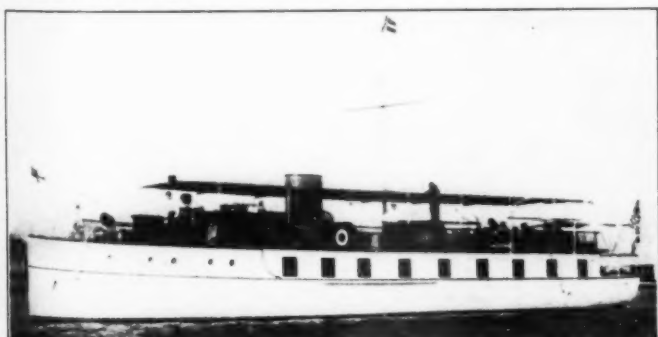


No. 6029.—Unusual Twin Screw Gasolene Cruiser. 94 x 15½ x 6. Electric lights. Sleeps 14 besides crew. Passed British Lloyds survey. Two 25 H. P. Standards installed 1911. Speed 10 miles. Appearance and staunchness of steam yacht with comfort and economy of motor boat. Interior handsomely done in solid mahogany. Inventory exceptionally complete. Can be bought right or chartered. Stanley M. Seaman, 220 Broadway, New York.

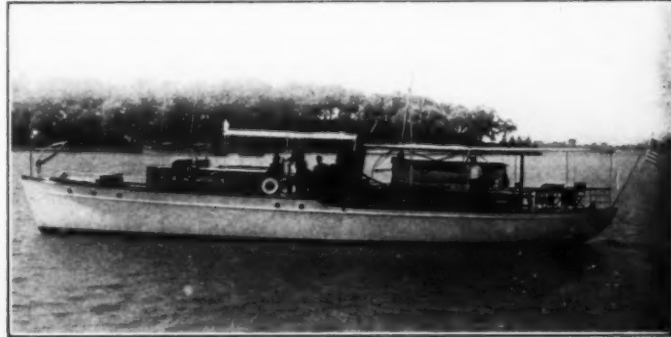


No. 6856.—Twin Screw Seagoing Lawley Cruiser. 90 x 17 x 4½. Launched, 1909. Used two seasons. 4 staterooms, berths 6, bath, 2 toilets. Two 60 H. P. Craigs. Speed, 12 miles. Electric lights and heat. 4 tenders in davits. Ideal American gentleman's yacht. Elegant appointments. Good as new. Reasonable price. Stanley M. Seaman, 220 Broadway, New York.

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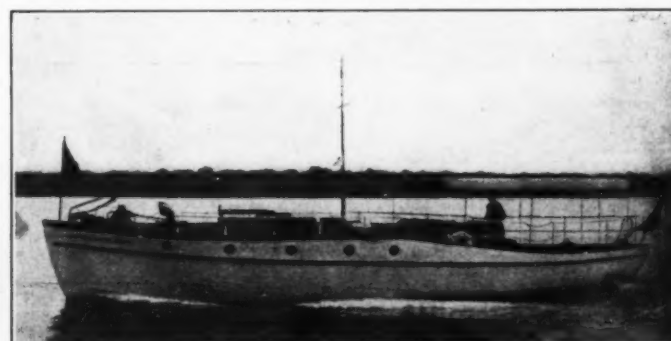
No. 6779.—90 x 17.4 x 3.3. Launched 1911. 4 staterooms and saloon, berth 11. 2 baths, 3 toilets. Two 60 H. P. Craigs. 12 miles; 4 crew. Ideal American coast cruiser. Cost \$28,000. Price low. Stanley M. Seaman, 220 Broadway, New York.



No. 6855.—Latest Type Coast Cruiser. 66½ x 13 x 4. Launched 1911. 2 staterooms and saloon, berth 6. All mahogany finish. Electric lights, bath, 2 toilets. 40-50 Standard. Speed 11½ miles. Deck control. Elegant cruising inventory. Exceptionally high grade craft. Low price. Stanley M. Seaman, 220 Broadway, New York.



No. 6708.—Express Cruiser. 75 x 10 x 5.9. 2 staterooms and saloon, berth 8. Mahogany interior. Headroom over 6 feet. Electric lights. 2 toilets. 65-90 Speedway, new 1911, in perfect condition. Speed 16 miles. Complete equipment. Great bargain. Stanley M. Seaman, 220 Broadway, New York.



No. 6506.—48 x 11 x 3½; built 1910; extra heavy construction; stateroom and saloon; berth 6; 30 Ralaco new 1911; speed 11 miles; cruised 2,500 miles on Great Lakes. Cost \$5,500. Price \$3,700.

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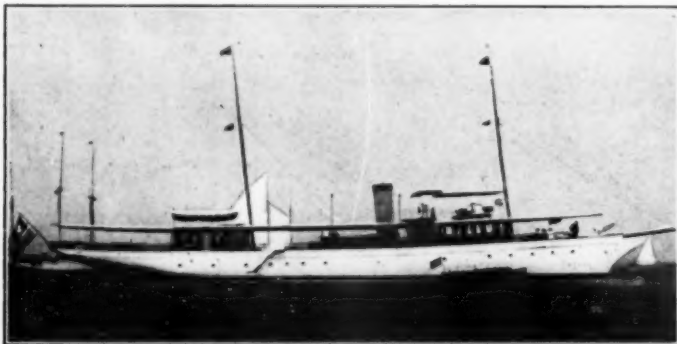
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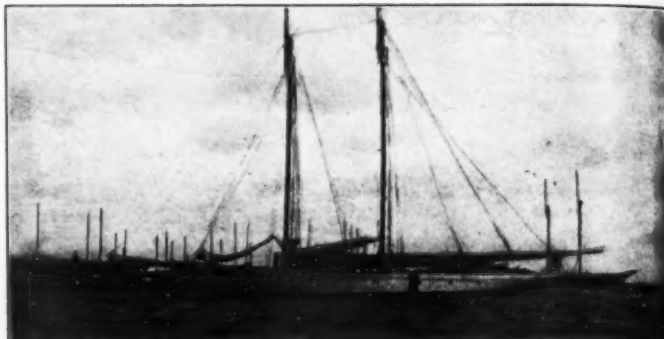
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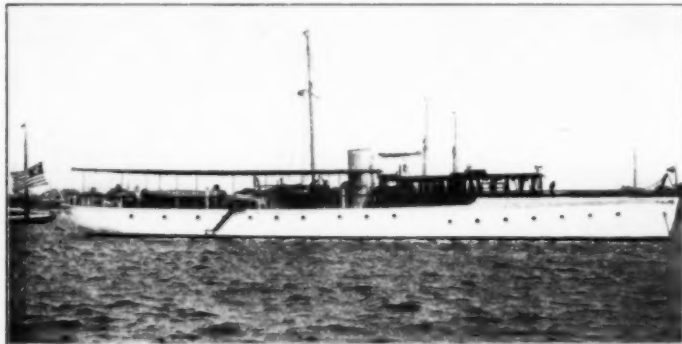
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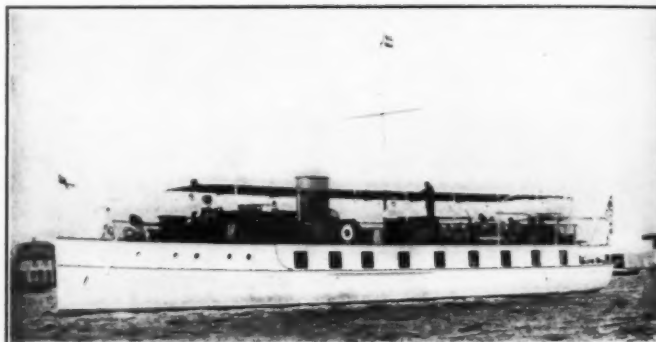
No. 340.—For sale and charter—modern, 130 ft. steam yacht; two deck houses and excellent owner's accommodation; best possible condition.
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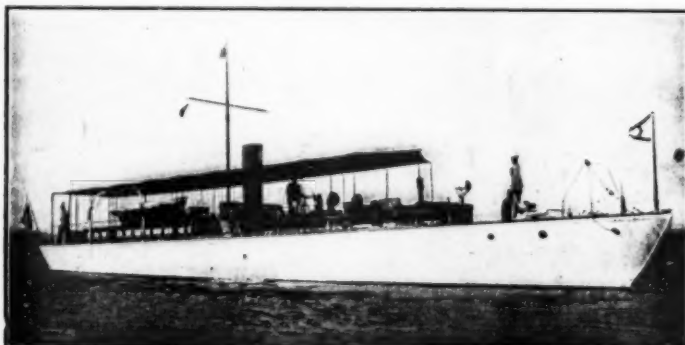
No. 209.—Modern, steel auxiliary schooner, 90 x 18; excellent accommodations; reasonable figure.
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No. 1553.—Fast, 118 ft., steel, twin-screw power yacht; exceptional accommodation; speed 18 miles.
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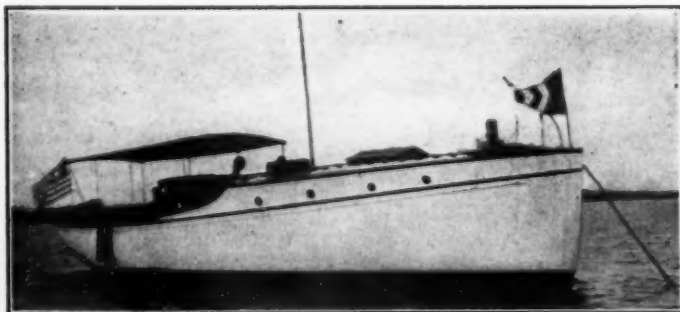
No. 1745.—Combination houseboat and cruiser, 90 ft., two 60 Craigs.
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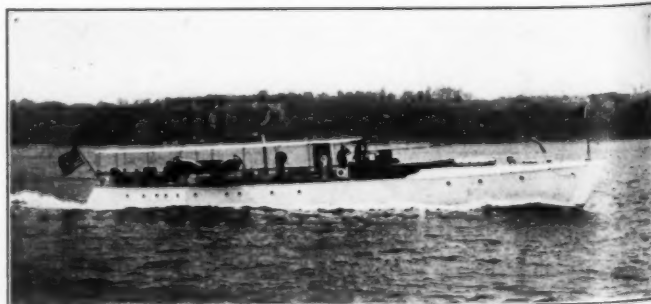
No. 948.—91 ft. power boat; two 125 H. P. Craig engines; speed 18 to 20 miles. Price exceptionally low.
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No. 1334.—Able and roomy 93 ft. twin-screw launch; two 60 H. P. Craig engines. Low figure.
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No. 1607.—Popular type, 40 ft. cruiser; Standard engine; best construction.
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No. 1243.—Fast 90 ft. steel gasoline yacht; two large Standard motors; speed 25 miles.
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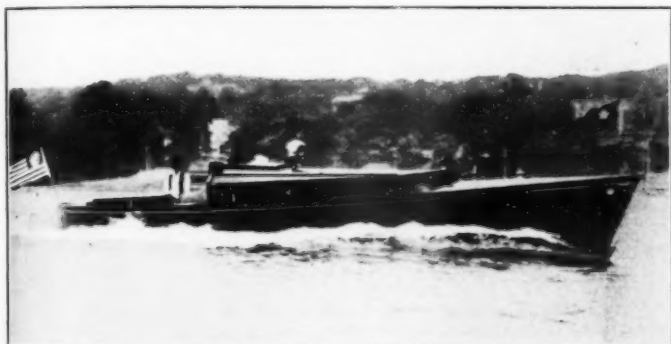
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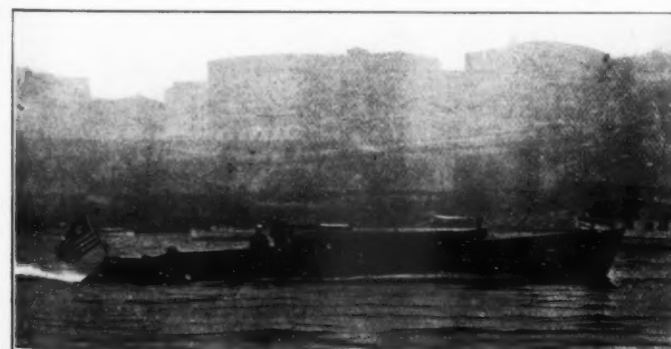
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No. 3461.—For Sale—Gielow design semi-speed runabout, about 25 miles, mahogany, cedar, copper fastened; 60-70 Jencick motor, double independent ignition, Bosch magneto and magneto plugs; carries ten, very staunch and quiet, highest grade boat, splendid condition. Sell half cost. Gielow & Orr, No. 52 Broadway, New York.



No. 3320.—For Sale—Fast and handsome craft, 50 x 6.6 x 2.6 feet draught. Speed 21 miles. A 100 H. P. engine is placed forward of cabin and is accessible through same or from folding hatch over the engine. Cabin has transom seat on each side, also toilet and folding basin. Cockpit 12 ft. long. A good seaboat. All engine controls at steering wheel. Gielow & Orr, No. 52 Broadway, New York.



No. 3192.—For Sale—Fast mahogany cruising launch, 50 x 6.6 x 2 ft. 6 in. draught; speed up to 19 miles. Built by Seabury. Excellent condition; very seaworthy. Awning over cockpit. Speedway motor, 90 H. P., is controlled at steering wheel; clutch is worked by lever alongside of same. Cabin fitted with two transoms and toilet. In-spectable near New York. Gielow & Orr, 52 Broadway, New York.



No. 3631.—For Sale—Hydroplane, 14 ft. o. a., 12 inches beam. Has made a speed of 29.4 miles an hour for 13½ miles with two people on board. Motor, 4 cylinder Fox de Luxe. Launched September, 1911, and used two weeks. Owner building larger. Gielow & Orr, 52 Broadway, New York.

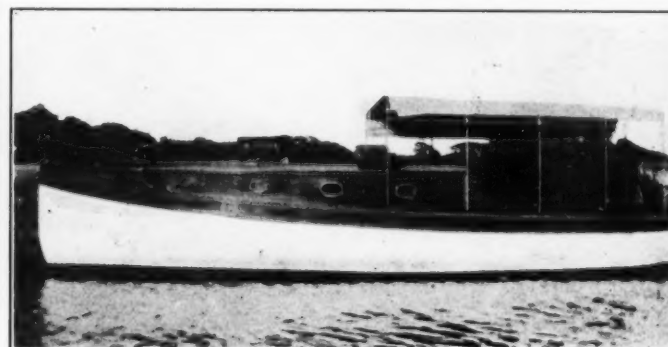
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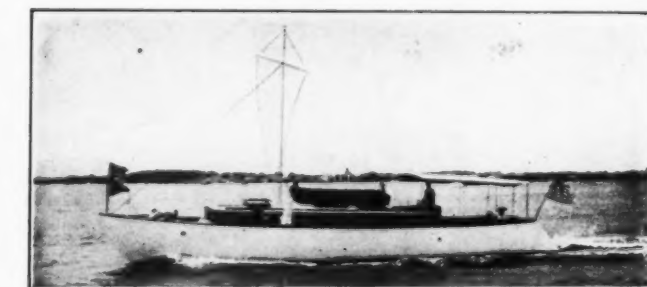
No. 548.—For Sale—Twin screw. A comfortable and roomy cruiser, 65 x 11 x 3 feet draught. Pilot house and two cabins, each containing two berths; can be shut off by doors making three private rooms. The cabins are separated by a dressing room on one side and toilet on opposite side with passageway between same. The after cabin being used as dining room. Two 45 H. P. 4 cylinder engines, electric light, etc. Full particulars from Gielow & Orr, No. 52 Broadway, New York.



No. 3324.—Sacrifice, owner having no time to use, 40 x 9.3 x 3. Copper fastened; two double staterooms; Apple dynamo and storage battery; 20 H. P. 4 cylinder, 4 cycle motor. Gielow & Orr, No. 52 Broadway, New York.



No. 3645.—For Sale—30 x 9 x 2.8 ft. Best of construction, copper fastened. Sleeps 4. Engine, 15 H. P., just overhauled. Speed, 8 m. p. h. Gielow & Orr, 52 Broadway, New York.



No. 2273.—For Sale—Desirable cruising launch, 52 ft. x 10 ft. x 3 ft. 6 in. draught. Forecastle with toilet, stateroom, galley and engine room. Large cockpit aft, from which launch is steered and controlled. Engine, 4 cylinder, 4 cycle, 25 H. P. Cruising speed 11½ knots. Mahogany finished throughout. High freeboard. Low mahogany cabin with 18-inch deck on each side. Plans and further particulars from Gielow & Orr, 52 Broadway, New York.

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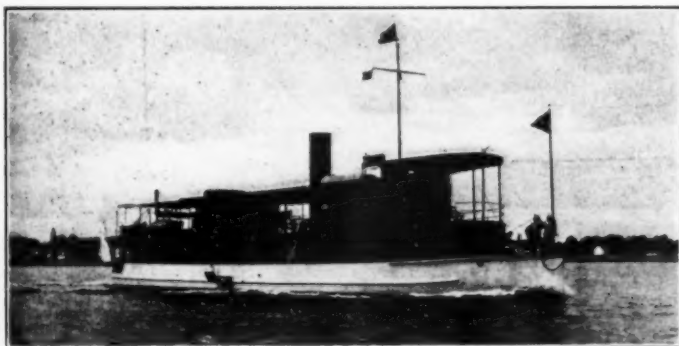
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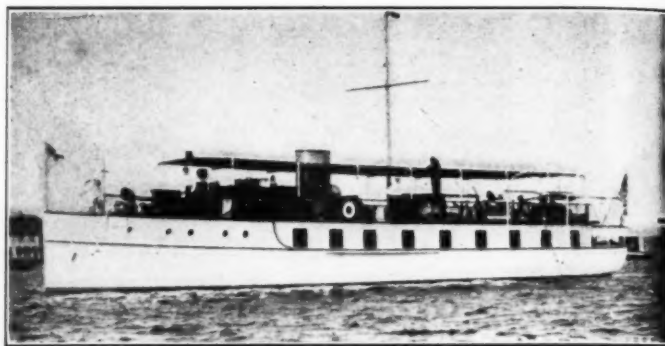
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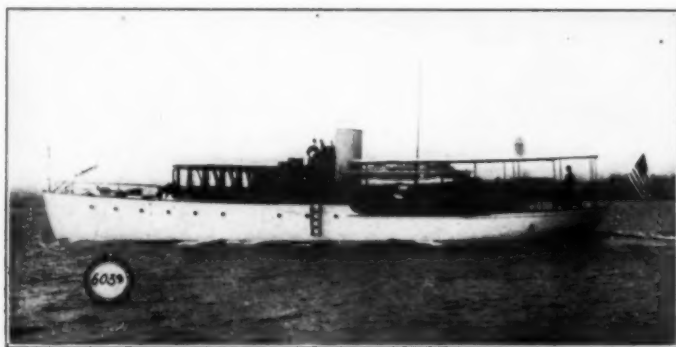
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No. 1849.—For charter and for sale; steel twin screw steam houseboat; 115 ft. x 17 ft. x 3 ft. 6 in.
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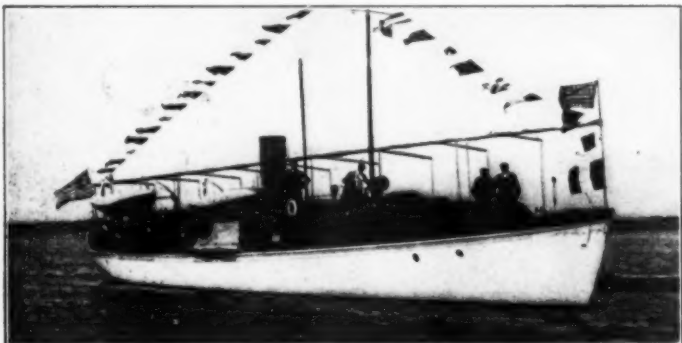
No. 1865.—For Sale or Charter, 90 ft. twin screw houseboat, practically new.
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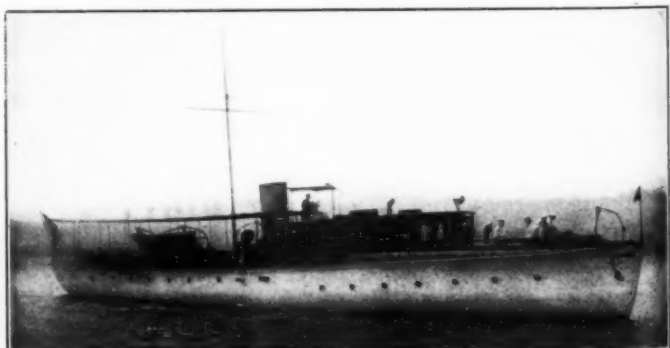
No. 7871.—For Sale—Attractive 83 ft. twin screw power yacht; Standard motors. Two double staterooms, bath; all conveniences; very desirable.
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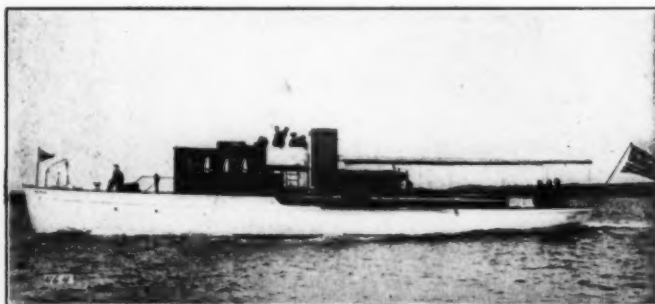
No. 7905.—For sale or charter, Lawley built 83 ft. motor yacht; excellent condition.
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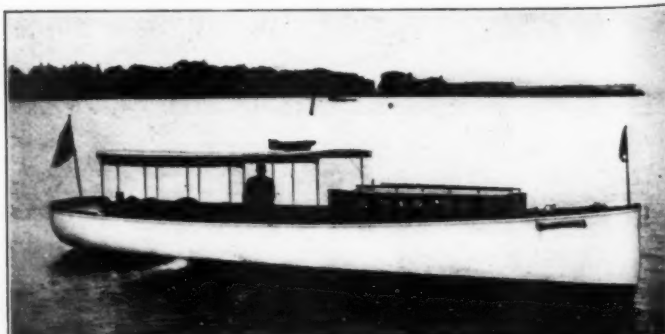
No. 7286.—For Sale—95 ft. twin screw. Price attractive.
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No. 7999.—For Sale or Charter—Fast twin screw power yacht. Exceptional accommodations.



No. 7442.—Lawley-built 80 ft. cruiser; 100 H. P. Standard; speed 12 knots. Low figure.
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No. 7405.—For Sale—Attractive price, 40 ft launch, good condition. Standard motor.
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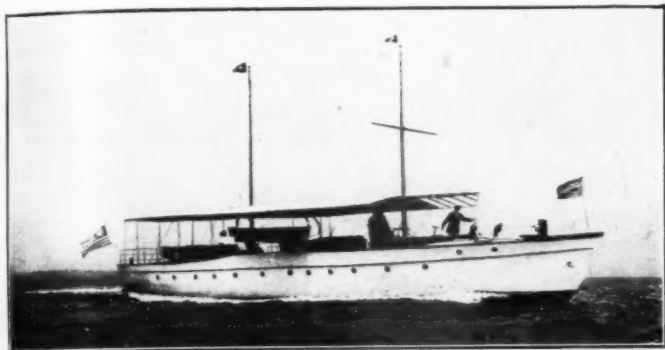
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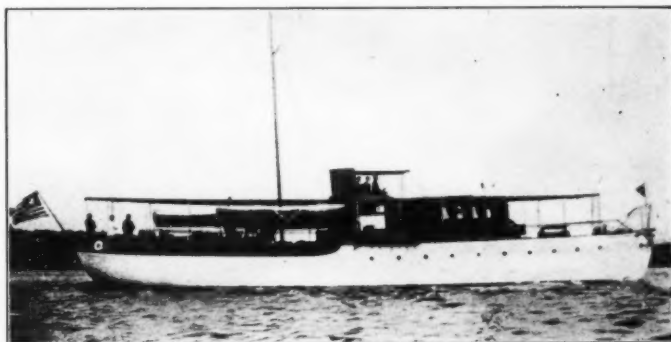
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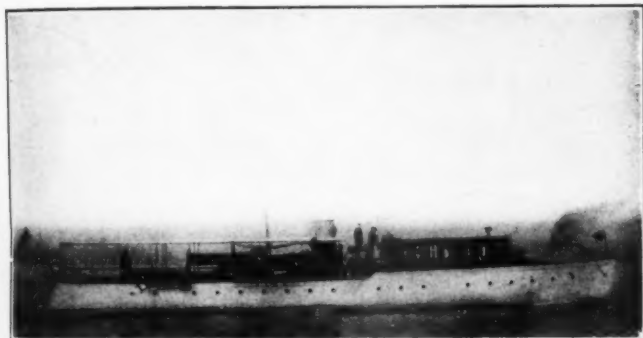
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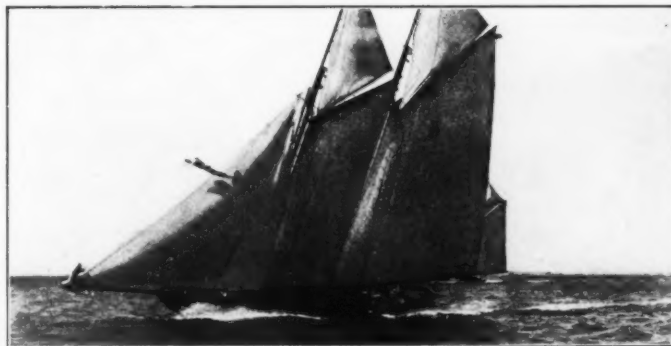
No. 7713.—For Sale or Charter.—75 ft. motor cruiser; saloon, two staterooms, bath; Standard motor: speed 12 miles.
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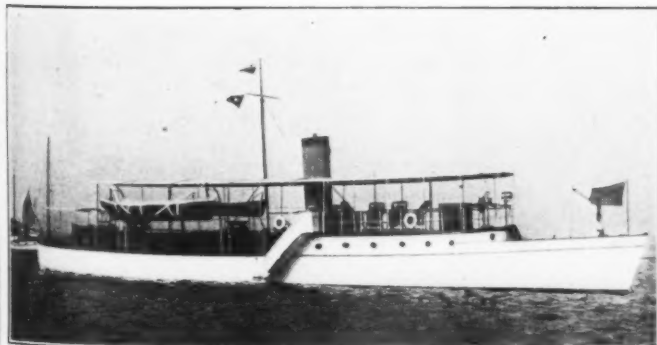
No. 7877.—For Sale.—Modern raised deck cruiser, 90 ft. x 83 ft. x 17 ft. x 3 ft. 6 in. draught; built 1909; saloon, 3 staterooms, bath, 3 W. C.'s, 2-60 H. P. Craig motors;



No. 7996.—98 ft.; fast; twin screw; gasoline; new 1910; price attractive.
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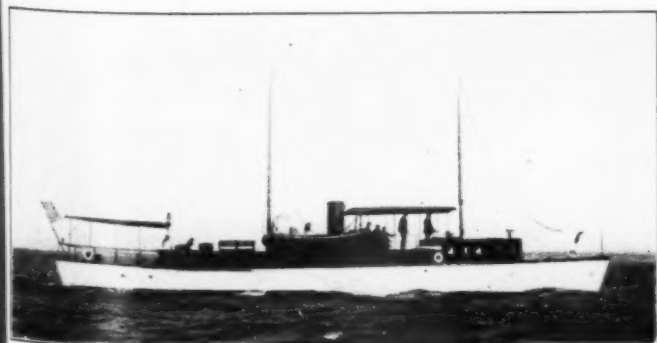
No. 1045.—For Sale.—Flush deck auxiliary schooner, 97 ft. 4 in. over all; 70 ft. water line, 19 ft. 6 in. beam, 8 ft. 6 in. draught; designed by us; built by Lawley large saloon, 3 staterooms, 2 baths, 3 W. C.'s 6 ft. 6 in. headroom; 600 gallon water tank; cutter, launch and dinghy; Ratsey sails; 75 H. P. Simplex motor; speed 8 miles; 170 gallons gasoline; fully found in all departments; fast under sail; exceptionally able.



No. 7291.—For Sale.—92 ft. seagoing motor yacht; Twentieth Century motor; excellent condition.
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No. 1856.—For Sale.—Speed launch, 32 ft. x 6 ft. beam; 2 cycle 24-29 H. P. motor; speed 18 miles; comfortably seats eight people in cockpit; fully equipped; substantially built; good sea boat. Price attractive.



No. 7146.—For Sale.—Modern cruiser, 85 x 80 x 14 x 4 ft. 6 in. draught; built 1906; new Twentieth Century motor, 1911; 3 double staterooms; large saloon, bath room, etc.
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No. 8180.—For Sale.—Practically new Elco Express Tender; launched last August; 20 x 4 ft. 6 in.; 4 cylinder A. & B. motor; speed 26 miles; substantially constructed; mahogany planked; seats four comfortably in two athwartship seats; complete equipment; in the pink of condition, having had the best of care; run less than 150 miles. Price attractive. Owner selling to build larger and faster boat. Makes an ideal yacht tender. Can be carried on the davits of any moderate size yacht.

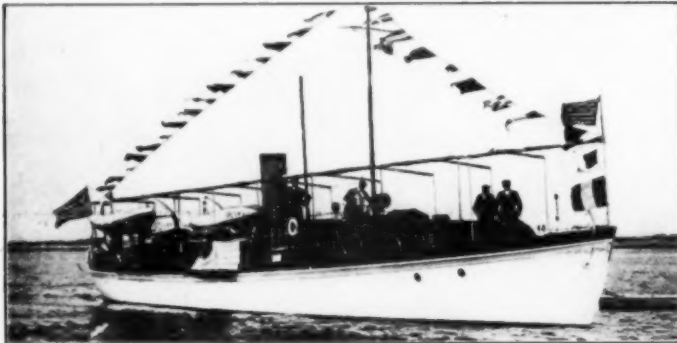
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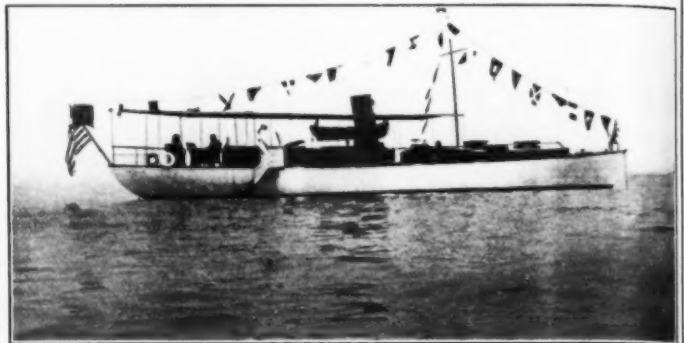
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We have a complete list of all steam and power yachts, auxiliaries and house boats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars mailed on request.



No. 381.—For sale or charter—twin-screw cruising power yacht; 93 x 13.6 x 4.6 feet. Speed, 14-16 miles; two 100-H. P. 6-cylinder Standard motors. Best construction; mahogany finish throughout. Double stateroom, bathroom, large saloon and galley, etc. Electric lights. In excellent condition. Owner anxious to sell, having built larger. Apply to Cox & Stevens, 15 William Street, New York.
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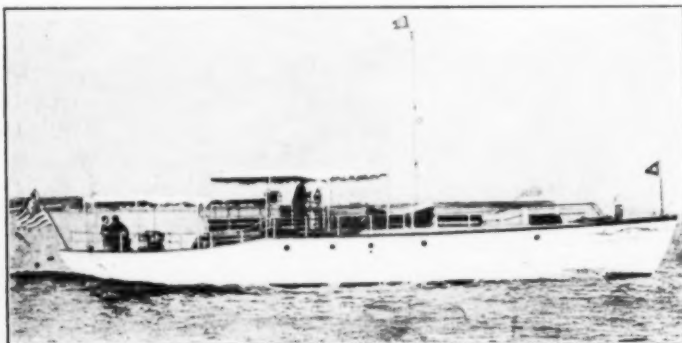
No. 368.—For sale—fast and able power yacht; 78 x 11 x 4 feet. Lawley build. Speed, 14-16 miles; 100-H. P. Standard motor. Accommodations include two double staterooms, saloon, two toilet rooms, etc. Interior finish mahogany and white. Electric lights. In first-class condition. A very desirable cruiser or fast ferry for off-shore service. Located on Great Lakes. Price very low. Apply to Cox & Stevens, 15 William Street, New York.



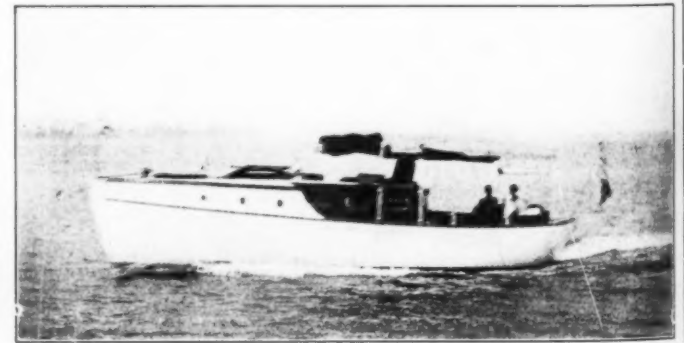
No. 6.—Offer wanted—twin-screw steam yacht; 69 x 17 x 5 feet. Excellent condition. Large accommodation. Adapted for passenger service. Dimensions allow navigation of Erie and other canals. Owner very anxious to sell. Cox & Stevens, 15 William Street, New York.
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No. 359.—For sale—desirable twin-screw cruising motor yacht; 65 x 13 x 3 feet. Speed, 12 miles; two 18-24-H. P. Standard motors. Accommodations include pilot house, double stateroom, 10-foot saloon, two toilets, etc. Interior finish of mahogany, bird's-eye maple, etc. Complete inventory, including launch (new 1910) and dinghy. In first-class condition. An exceptionally able, handsome and roomy craft. About \$3,200 was spent on her in 1910 in overhauling and improvements. Bargain for quick sale. For further particulars, plan, etc., apply to Cox & Stevens, 15 William Street, New York.



No. 993.—For sale—raised deck cruiser; 60 x 13 x 3.6 feet. Built 1909. Speed, 9-10 miles; 28-30-H. P. Standard motor. Large double stateroom, 10-foot saloon with four berths, bathroom, acetylene lights, etc. Interior finish of white enamel and mahogany. Completely found, including launch and dinghy. First-class condition. Located on Great Lakes. Apply to Cox & Stevens, 15 William Street, New York.
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No. 1379.—For sale—sloop'd combination day boat and cruiser; 38 x 8.9 x 3 feet. Built 1910 from our design; best construction. Teak finish throughout. Speed, 11 miles; 30-H. P., 4-cylinder, 4-cycle motor, electric lights, etc. Cockpit, 10 feet 6 inches long; saloon, 6 feet 6 inches long with two transoms, toilet room, etc. Fine sea boat; in first-class condition. For plans and further particulars apply to Cox & Stevens, 15 William Street, New York.



No. 14.—Bargain—steel steam yacht; 94 x 14 x 6 feet. Exceptionally fine sea boat; excellent condition. Speed, 12-14 miles. Three staterooms, large dining saloon, etc. Full particulars, plans, etc., from Cox & Stevens, 15 William Street, New York.
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No. 31.—Offer desired. 96 x 16.6 x 4.2 feet. Twin-screw passenger motor yacht. Speed, 12 miles; two 50-H. P. Murray & Tregurtha motors. Mahogany finish throughout. Owner anxious to sell.
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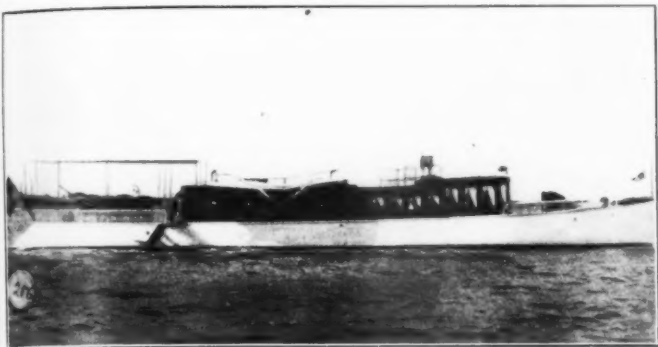
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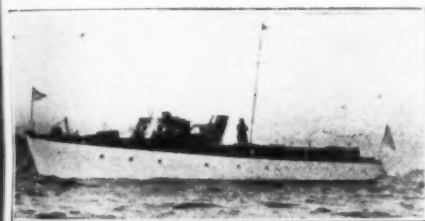
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A few are shown on this page. Plans, photographs and full particulars mailed on request.



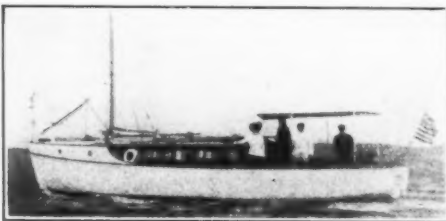
No. 256.—Sacrifice.—Fast cruising motor yacht; 74 x 11 x 4 ft.; speed 15-16 miles; 100 H. P. 6 cyl. Speedway motor installed Fall, 1910; forward saloon, stateroom, separate galley, etc.; large after deck and bridge; mahogany finish; in first class condition; fully found; must be sold. Apply to Cox & Stevens, 15 William St., New York. Telephone 1375 Broad.



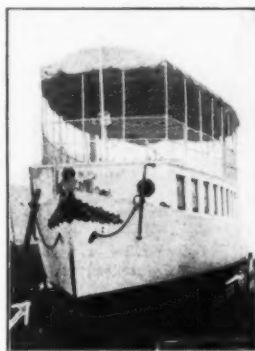
No. 278.—For Sale at Low Figure.—Cruising motor yacht; 67 x 10.5 x 3 ft.; speed 12 miles; 50 H. P. Standard motor; large saloon and double stateroom forward; galley and engine room aft; mahogany finish throughout; fully found; immediate sale desired on account of owner's death; in excellent condition. Apply to Cox & Stevens, 15 William St., New York.



No. 374.—For Sale.—Fast gasoline cruiser; 70 x 10 x 3.5 ft.; speed 14-16 miles; 75 H. P. 6 cylinder Speedway motor (installed 1911); Independent electric lighting plant; two staterooms, saloon, two toilets, etc.; finished in white enamel and mahogany; full equipment (considerable portion new 1909); substantially constructed hull; all motor controls on bridge; price very low. Apply to Cox & Stevens, 15 William St., New York.



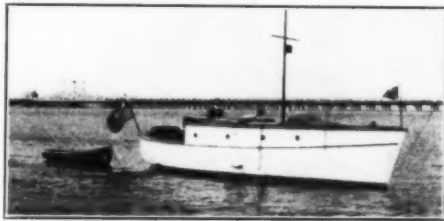
No. 1506.—Excellent Bargain.—42.6 x 8.6 x 2.8 ft.; raised deck cruiser; built 1909; speed 10 miles; 16-20 H. P. 4 cylinder; Standard motor; owner has larger. Apply to Cox & Stevens, 15 William St., New York.



No. 1548.—Bargain.—Power houseboat; 70 x 16 x 3.9 ft.; speed 9 miles; 60 H. P. Craig motor; accommodations include double stateroom, main saloon, 30 x 13 ft., two toilets, etc.; in excellent condition. Cox & Stevens, 15 William St., New York.



No. 544.—Exceptional Bargain.—Able and roomy. 65 x 14 x 4 ft. twin screw gasoline cruiser; speed 11 1/2 miles; two 40 H. P. 4 cyl. Globe motors (installed 1908); large accommodation; electric lights; first class condition; completely found. Apply to Cox & Stevens, 15 William St., New York.



No. 1670.—For Sale.—31 x 8 ft.; raised deck cruiser; built 1908; speed 9 miles; 15 H. P. 4 cyl. 4 cycle Buffalo motor; cabin 7 ft. long with two berths, toilet room, etc.; electric lights; 9 ft. dinghy; in excellent condition; bargain. Cox & Stevens, 15 William St., New York.

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No. 1672.—Bargain.—31 x 5 ft., semi-speed canopy top launch; speed up to 15 miles; 30 H. P. 4 cyl. 4 cycle "American & British" motor installed 1910; comfortable family boat, in excellent condition; engine enclosed in wood and glass case; full equipment; owner anxious to sell, having purchased large cruiser through us. Cox & Stevens, 15 William St., New York.



No. 1663.—For Sale.—Very able and roomy trunk cabin cruiser; 45 x 10.6 x 3 ft.; built 1910; speed 11-12 miles; 25-35 H. P. Standard motor; mahogany finish; electric lights; Double stateroom, saloon, etc.; first class condition.

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No. 647.—Exceptional Opportunity.—Fastest auxiliary (gasoline) schooner yacht under power; 105 ft. o. b., 25 ft. w. l., 24.6 ft. beam, 5.6 ft. draft; recent build; three staterooms, two bathrooms, etc.; speed, under power, 9 knots; handsomely finished and furnished. Cox & Stevens, 15 William St., New York.

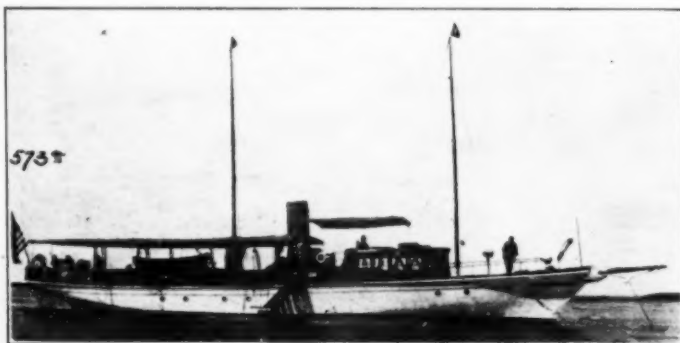
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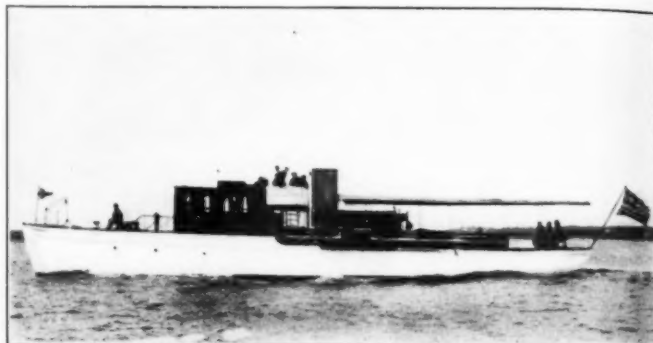
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No. 573.—For Sale or Charter.—90 ft.; twin screw power yacht; speed 11 miles; large accommodations, including three double staterooms, main and dining saloons, bathroom, etc.; in first class condition; handsomely finished and furnished; unusual bargain.

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No. 464.—For Sale or Charter.—81 x 13 x 4 ft.; Lawley built power yacht; speed 13-15 miles; 100 H.P. Standard; two double staterooms, main and dining saloons, etc.; electric lights; bargain.

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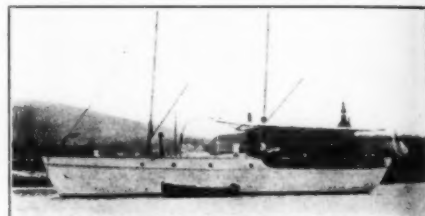
No. 316.—For Sale at Low Figure.—96.6 x 14 x 4-3 ft. power yacht; Lawley build; speed 14 miles; two 50 H. P. Standards; three staterooms, two toilets, etc.; first class condition.

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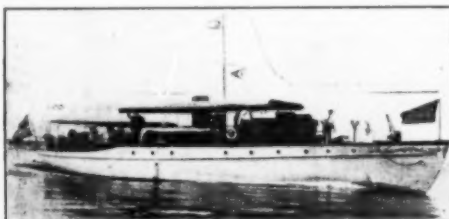
No. 470.—For Sale.—Raised deck gasoline cruiser; 60 x 12 x 3.6 ft.; speed 11 miles; 40 H. P. Lamb motor; double and single stateroom, large saloon, electric lights, complete equipment; mahogany joiner work throughout; very able and in first class condition. Price attractive.

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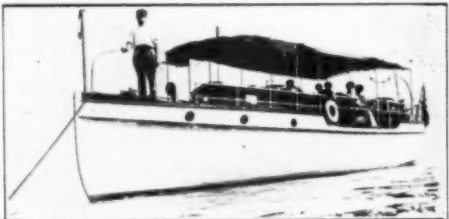
No. 1382.—For Sale.—Lawley built cruiser; 55 x 11 x 3.6 ft.; speed 10-11 miles; 25-35 H. P. Standard motor; double stateroom; saloon sleeps four; mahogany finish throughout; price low. Apply to Cox & Stevens, 15 William Street, New York.

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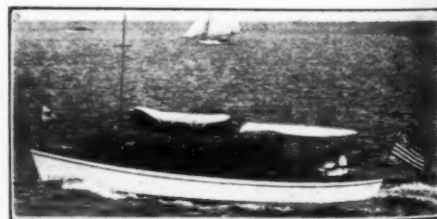
No. 600.—For Sale.—75 x 15 x 3.6 ft.; twin screw power yacht; speed 12-13 miles; two 6 cyl. 40-50 H. P. Standards; two double staterooms; large saloon, bath, etc.; excellent condition.

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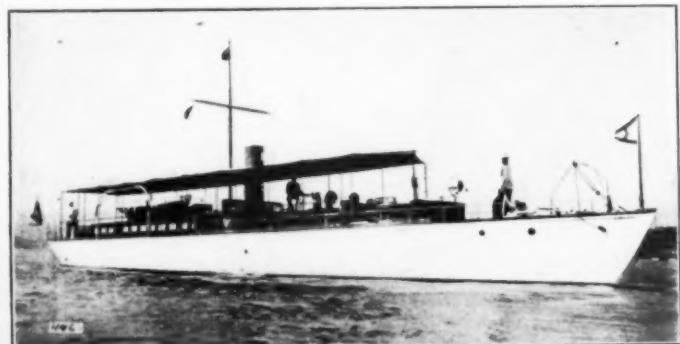
No. 668.—For Sale.—Desirable 50 x 10.3 x 3.6 ft. bridge deck cruiser; speed 10-11 miles; 25-35 H. P. Standard motor; stateroom, two saloons, bath, etc. Cox & Stevens, 15 William St., New York.

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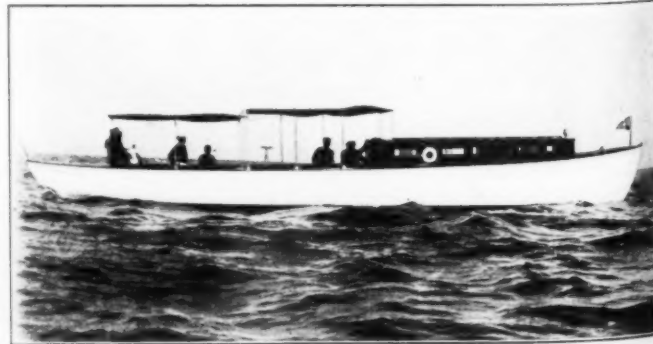
No. 565.—Bargain.—40 x 9 x 3 ft. cabin cruiser; best construction by well known firm; mahogany finish throughout; speed 10-11 miles; 20-25 H. P. Twentieth Century motor; excellent condition.

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No. 446.—Bargain.—High speed cruising power yacht; 91 x 12.4 x 3.6 ft.; speed 18 miles; two 150 H. P. Craig motors; double stateroom, large saloon, two toilet rooms, etc.; fully found.

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No. 910.—Exceptional Bargain.—53.5 x 10.3 x 3 ft.; Lawley built day cruiser; very best construction; teak finish throughout; saloon with two transoms, toilet, etc.; completely found; will be sold without motor; best of type available.

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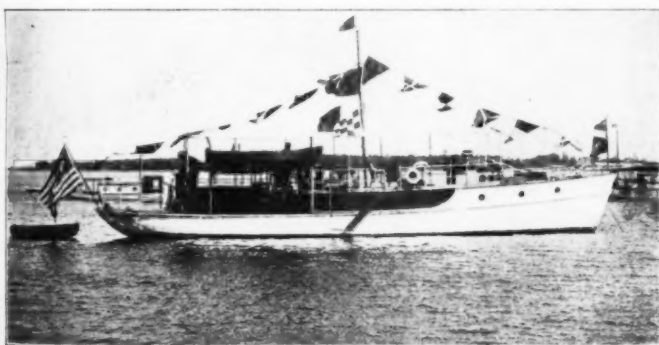
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We have a complete list of all steam and power yachts, auxiliaries and houseboats available for SALE and CHARTER for WEST INDIES and FLORIDA. A few are shown on this page. Plans, photographs and full particulars mailed on request.

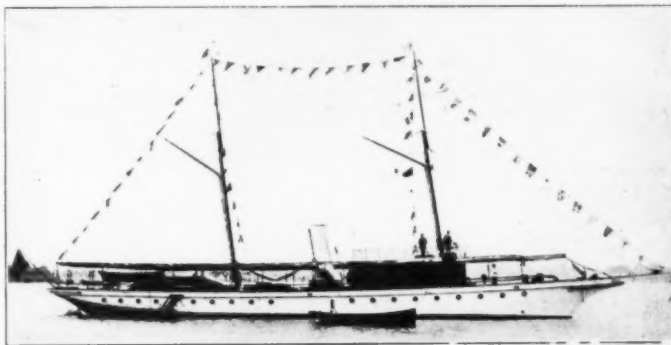


No. 107.—Exceptional Opportunity—American built modern fast 170 ft. steel steam yacht in perfect condition. 120 deck houses, five staterooms, 3 bathrooms. All hardwood finish. Complete equipment. For quick sale will accept very low figure. Full plans and particulars on application to Cox & Stevens, 15 William St., New York.

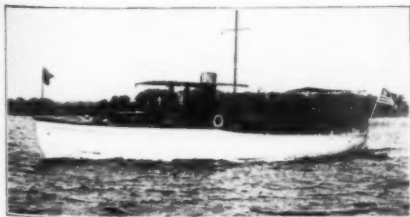


No. 1592.—At less than half cost—60 x 12 ft. raised deck cruiser; built 1909. Speed, 10-11 miles. Two double staterooms, bath, etc. Owner has larger. Cox & Stevens, 15 William St., New York.

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No. 130.—For Sale—Desirable steel steam yacht; 140 ft. o. a., 17.6 ft. beam, 7 ft. draft. Speed, 14 knots; triple expansion engine. Six staterooms, two bathrooms, steam heat, electric lights, etc. Handsomely finished and furnished. Especially suited for Great Lakes. Price attractive. For plans and further particulars apply to Cox & Stevens, 15 William St., New York.



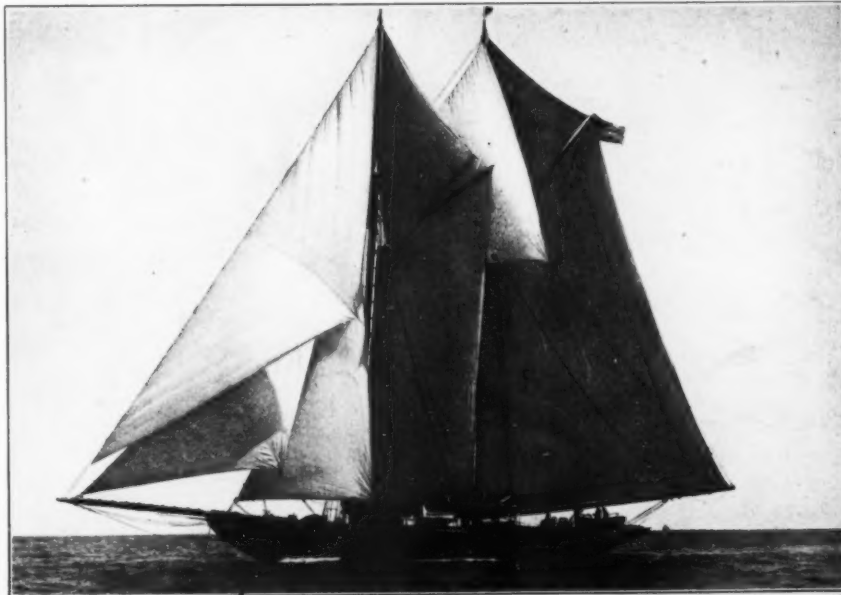
No. 579.—For Sale—Handsome power cruiser; 60 x 11.6 x 4 ft. Built 1909. Speed 11 miles. Double stateroom, saloon, electric lights, etc. Fully found. Excellent condition. Price attractive. Cox & Stevens, 15 William St., New York.

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No. 669.—Sacrifice—40 x 8 ft. fast family launch. Speed up to 20 miles; 60 H. P. Standard auto-marine motor. Cox & Stevens, 15 William St., New York.

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No. 15.—For Sale—Handsome, able and roomy flush deck keel, auxiliary schooner yacht; 98 ft. o. a., 68 ft. w. l., 20 ft. beam, 9 ft. draft. Recent build. One double and two single staterooms, large saloon, bathroom, two toilets, acetylene lights, etc. Speed under power 5 miles; 50-60 H. P. Standard motor (installed 1910). Handsomely finished and furnished. Price attractive. Apply to Cox & Stevens, 15 William St., New York.

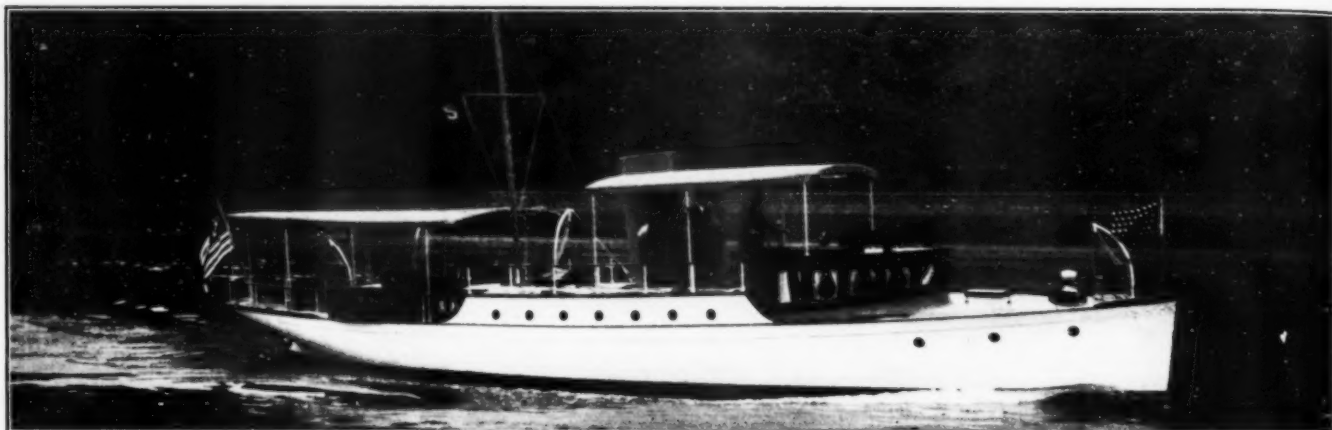
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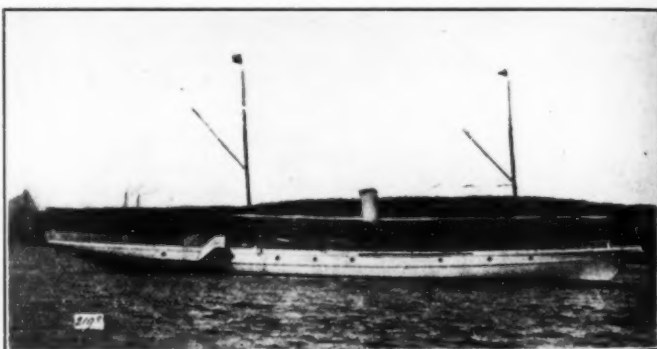
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars mailed on request.



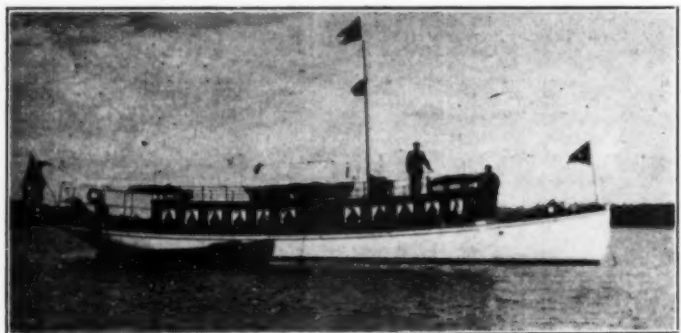
No. 1387.—For Sale.—Latest type twin screw power yacht; 65 x 11.6 x 4.3 ft. Built 1911 from our designs in best manner. Speed, 13-14 miles; two 35-45 H. P. 20th Century motors. Dining saloon and galley forward; two double and one single staterooms, bath, etc., aft. Handsomely finished and furnished. Price attractive.



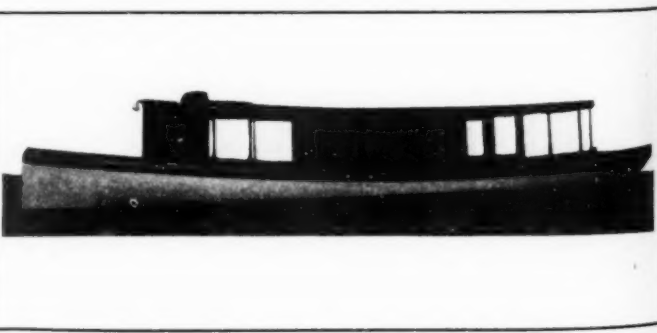
No. 1227.—Excellent bargain.—Desirable cruising motor yacht; 70 x 12 x 3.10 ft. Built by Seabury in best manner. Speed, 12-13 miles; 70 H. P. 20th Century motor. Independent lighting plant. Handsomely finished in mahogany throughout. Pilot house, stateroom, main saloon, galley, etc. Perfect ventilation throughout. Owner has purchased larger power yacht through us, therefore anxious to make quick disposal. Cox & Stevens, 15 William St., New York.



No. 219.—Sacrifice.—To close estate, steam yacht, 112 ft. o. a., 13.3 ft. beam, 6 ft. draught. Speed 12 knots; triple expansion engine; water tube boiler, new 1909. Two double and two single staterooms, bath; electric lights, etc. In 1909 was thoroughly overhauled and numerous improvements made. Full particulars, plans, etc., from Cox & Stevens, 15 William St., New York.



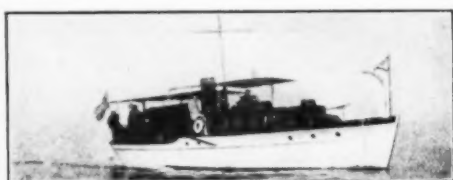
No. 365.—For sale at a bargain. Gasoline cruising launch, 61 ft. over all, 12 ft. beam, 4 ft. draught; strong construction, copper fastened; steers from pilot house and bridge; deck house mahogany, plate glass windows; one boat on davits, etc., complete; roomy pilot house and saloon forward with galley and toilet; good engine room with two berths for crew and two 25 H. P. Standard motors; large main saloon and owner's quarters aft, nicely furnished and with ample stowage room. Would be a fine, comfortable craft for cruising in both Northern and Southern waters or passenger service. Apply to Cox & Stevens, 15 William St., New York.



No. 1640.—Sacrifice.—Glass cabin launch, 41 x 6.6 x 3.4 ft. Built 1909. Speed 12 miles; 20 H. P. motor. Copper gasoline tank, 80 gals. Hull copper fastened; finished in oak and mahogany. Toilet room. In first-class condition. Price extremely low. Cox & Stevens, 15 William St., New York.



No. 1348.—Offer Wanted.—Half cabin launch (similar to illustration), 50 x 8 x 4 ft. Built by Gas Engine & Power Co. In excellent condition. Speed 12 miles; 4-60 H. P., 6 cyl., 4 cycle Sterling motor. Finish throughout of mahogany. Best construction. Anxious to sell to close estate. Apply to Cox & Stevens, 15 William St., New York.



No. 1692.—For Sale.—65 x 13 ft. modern power yacht; practically new. Speed 11-12 miles; 40-50 H. P. Standard. Two double staterooms, dining saloon, bath, etc. Best of type and size available. Cox & Stevens, 15 William St., New York.

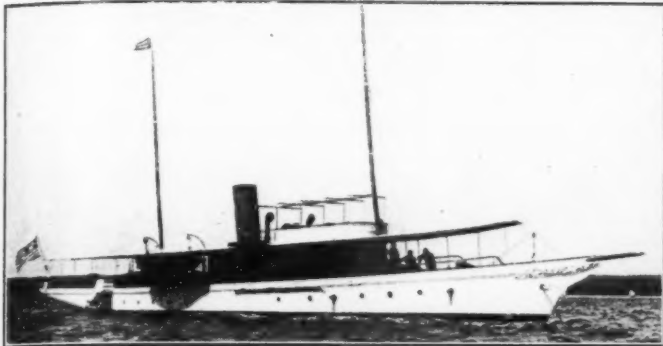


No. 992.—Bargain.—30 x 7 ft. raised deck cruiser in first class condition. Speed 8 miles; 7 1/2 H. P., 2 cyl. Buffalo motor. Cabin 12 ft. 6 in. long, sleeps three on berths; toilet room, galley, etc. Completely found, including 10 ft. dory, skiff. Cox & Stevens, 15 William St., New York.

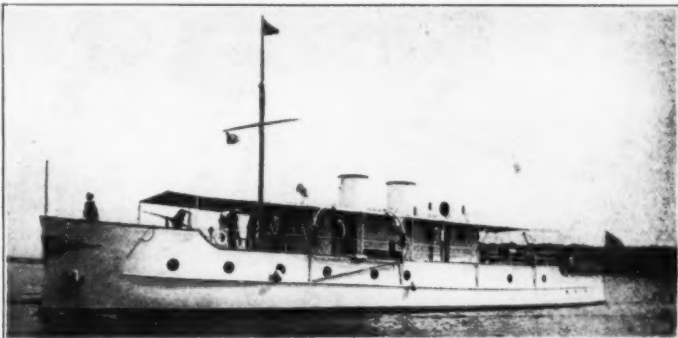
STANLEY M. SEAMAN'S PAGE

SEE PAGES 61 and 72 FOR MODERN GASOLINE CRUISERS

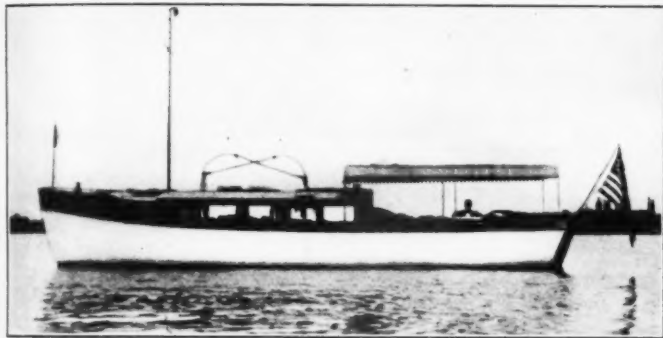
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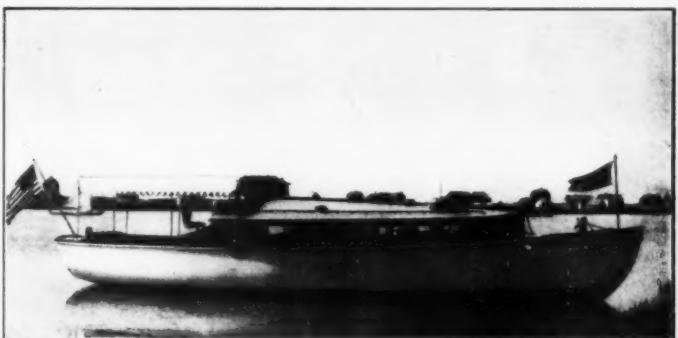
No. 2697.—Steel coast cruiser; 143 x 118 x 16 x 6.3. One of the speediest craft in American fleet. Five staterooms. Deck dining saloon. Three toilets. Speed, 16 miles. Has record 20.5 miles. Over \$25,000 recently spent for permanencies. Practically new boat. First class 80 to 100 feet steam or power yacht accepted part payment. Want offer. Stanley M. Seaman, 220 Broadway, New York.



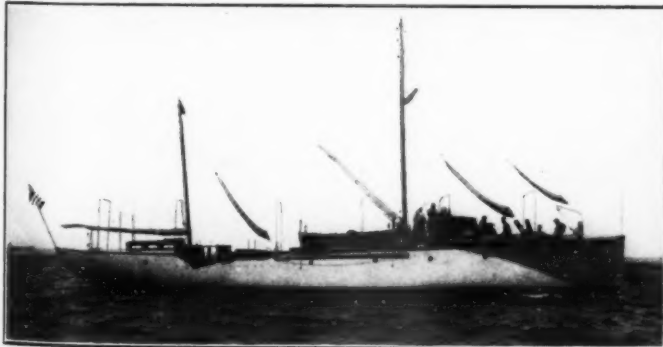
No. 5318.—Twin screw sea cruiser; 100 x 18½ x 4. Built by day's work—cost \$40,000. Five staterooms. After saloon. Deck dining room. Speed, 12 miles. Beautifully finished in mahogany. Maintained more economically than gasoline boat same size. Fuel consumption only 1½ tons in 10 hours. Cruising radius, 3,500 miles; 3,000 gallons fresh water capacity. Low price. Stanley M. Seaman, 220 Broadway, N. Y.



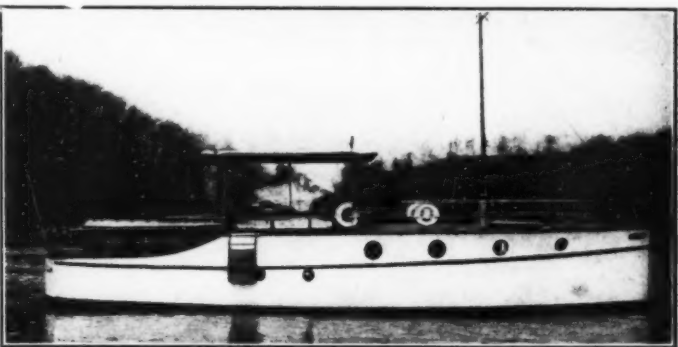
No. 6700.—Brand new cruiser, 42 x 9½ x 2½, launched 1911. 14-foot cockpit with steering gear and engine control forward. Stateroom and saloon berth 4. Toilet. Galley. Berth in engine room. Mahogany interior gives 6.3 headroom. 20 H. P., 4-cycle Palmer; speed 9 miles. Complete equipment, including 10-foot tender in davits. Low price. Stanley M. Seaman, 220 Broadway, New York City.



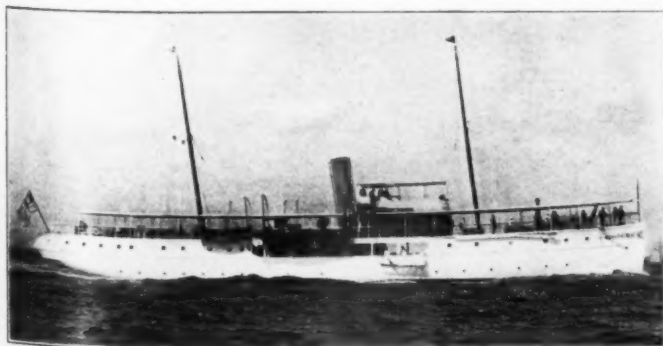
No. 5941.—Single handed light draught cruiser, 40 o. a., 9½ beam, 26 inches draught. A-1 construction. Cabin berths 4. Toilet. Galley. Headroom 6 feet 3 inches. Mahogany interior. 24 Lamb. Speed 10-11 miles. Completely equipped for cruising. Wholesome family cruiser offering superior light and ventilation. Low price. Stanley M. Seaman, 220 Broadway, New York.



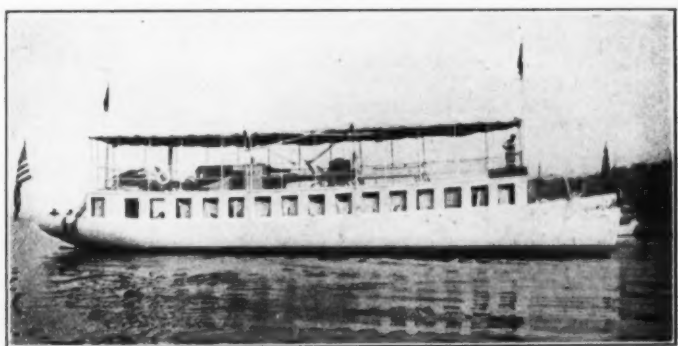
No. 6544.—Twin screw sea-going cruiser. 75 x 13.3 x 5.10. Deck and pilot house steering gear. Three staterooms and saloon berth 7. Bath. Interior finest selected African mahogany. Electric lights. 6.4 to 7 feet headroom. Two 65 Jagers. Speed 12 miles. Complete cruising inventory. Considered by many the finest example of sea cruiser. Cost over \$25,000. Low price. Stanley M. Seaman, 220 Broadway, New York.



No. 6613.—Latest type fine sea-going cruiser. 40 x 9 x 3½. Cost \$6,000 1911. Bridge steering gear and engine control. Stateroom and saloon berth 6. Three toilets. Electric lights. Headroom 6 feet 3 inches. 48 H. P., 6-cylinder Scripps. Actual speed 12 miles. Completely equipped. Will be sacrificed for quick sale. Inspectable New York. Stanley M. Seaman, 220 Broadway, New York.



No. 6037.—Steel coast cruiser. 176 x 24.7 x 11. Nine staterooms. Four baths. Speed 13 miles. Suitable auxiliary naval vessel. Cruised extensively Atlantic and West Indies. Price reasonable. Stanley M. Seaman, 220 Broadway, New York.

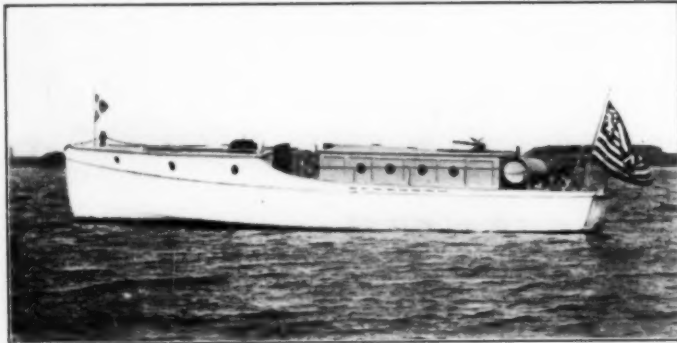


No. 6699.—70 x 16 x 3.9. Berths 8. Headroom 7 feet. Four staterooms can be added. Two toilets. Large galley. 60 H. P. Craig. Speed 9 miles. Fine cruiser. Cost \$8,000. Price just reduced to \$3150 for immediate sale. Stanley M. Seaman, 220 Broadway, New York.

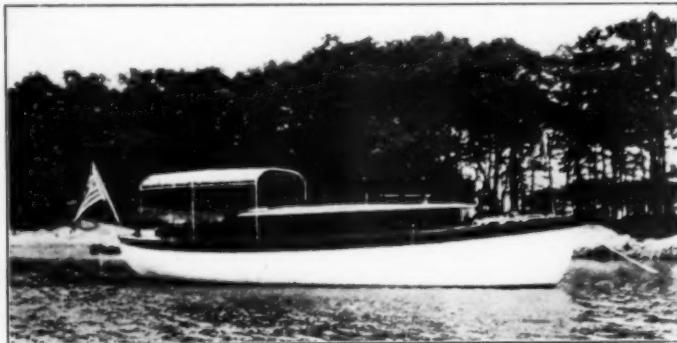
STANLEY M. SEAMAN'S PAGE

SEE PAGES 61 AND 71 FOR OTHER CHOICE OFFERINGS

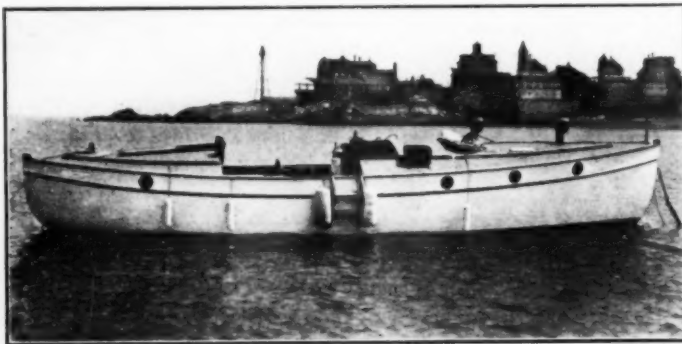
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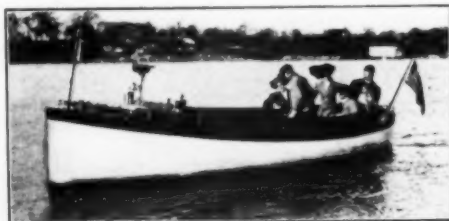
No. 6835.—Brand new cruiser, 36.8 x 9 x 4, launched 1911. Extra heavy construction. Cabin berths 4; toilet; headroom 6.2 ft.; 20 H. P. Mianus engine; speed 10 knots. Complete cruising equipment. Very able and consistent seaboat. Low price. Stanley M. Seaman, 220 Broadway, New York City.



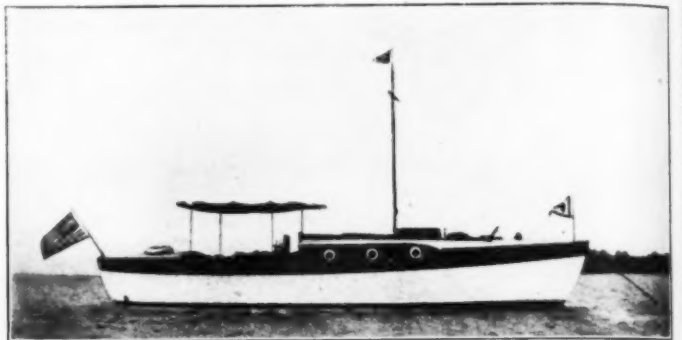
No. 6829. Single hander, 33 x 8 x 3; built by Jay; extra heavy. Berths 2 comfortably; toilet room; galley; headroom 5 ft. 9 in.; mahogany interior; berth in engine room; 12 H. P. Gray & Prior motor runs perfectly; speed 10 miles; copper gasoline tank in water tight compartment. Complete cruising inventory. In first class condition. Very low price. Stanley M. Seaman, 220 Broadway, New York.



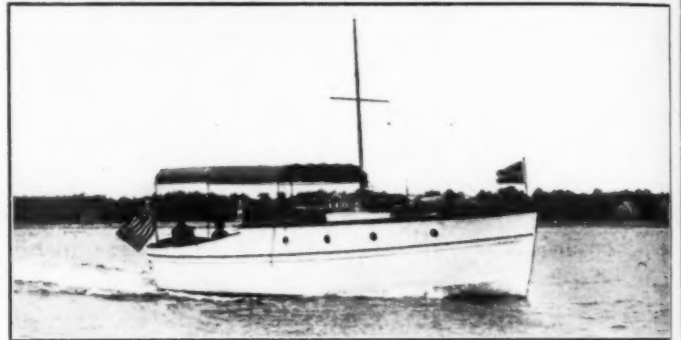
No. 6652.—Best single handed Seagoing Cruiser; 33 x 8 x 2½; launched 1911; berths 4; toilet; galley; 25-40 H. P. Sterling; speed 10 knots; cost \$3,000; price, \$2,000. Address Stanley M. Seaman, 220 Broadway, New York.



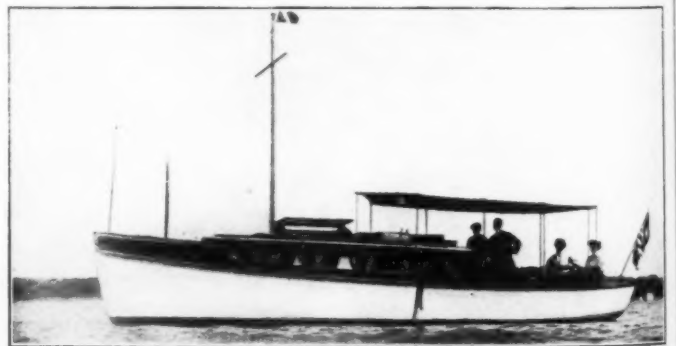
No. 6674.—Family Cruiser; 25½ x 6; launched 1907; 10 H. P. double cylinder Western engine; speed 9 miles; complete equipment; in first class condition; low price. Stanley M. Seaman, 220 Broadway, New York.



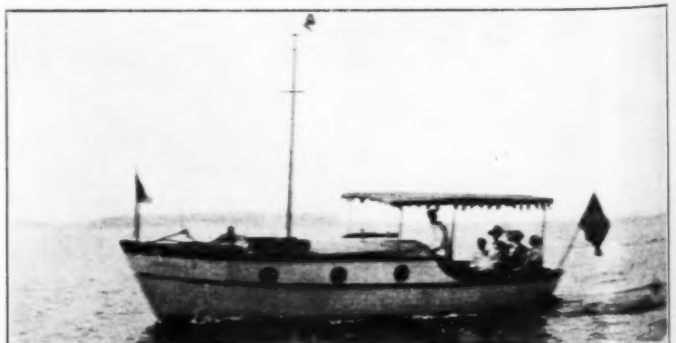
No. 6305.—Seagoing Cruiser, 38 x 8½ x 2.8; very heavy construction; three compartments berth 6 people; toilet; galley; 6 ft. headroom; solid mahogany interior, lighted by electricity; 25 H. P. Jager; speed 11 miles. Complete and elegant cruising inventory; very able and consistent under all conditions. In perfect condition throughout. Price reasonable. Stanley M. Seaman, 220 Broadway, New York.



No. 6676.—Single handed Cruiser, 35 x 8 x 3; launched 1911; cockpit, steering gear and controls; teak deck trimmings; cabin berths 4; toilet room; galley; 6 ft. headroom; electric lights, 50 H. P. 6 cylinder Harvard; speed 13 miles. Completely equipped; very able boat, suitable for outside work; low price. Stanley M. Seaman, 220 Broadway, New York.



No. 6407.—Able Single Handed Cruiser; 33 ft. o. a., 8 ft. beam, 2½ ft. draught, 10 ft. cockpit has steering gear and engine control forward; extra heavy construction; cabin 12 feet long, berths 4 people; toilet; galley; 6 ft. headroom; 24 H. P. 4 cycle motor; speed 10 miles; completely equipped; elegant sea boat; low price. Stanley M. Seaman, 220 Broadway, New York.



No. 6776.—Single Hander; launched 1911; 28 x 7.2 x 2; self-bailing cockpit, 8½ feet long; accommodates 6; has steering gear and engine control forward; extra heavy construction; cabin berths 4; toilet and galley aft; electric lights; 10 H. P. Racine engine; speed 9 miles; complete equipment, including 12 foot dinghy; low price. Stanley M. Seaman, 220 Broadway, New York.

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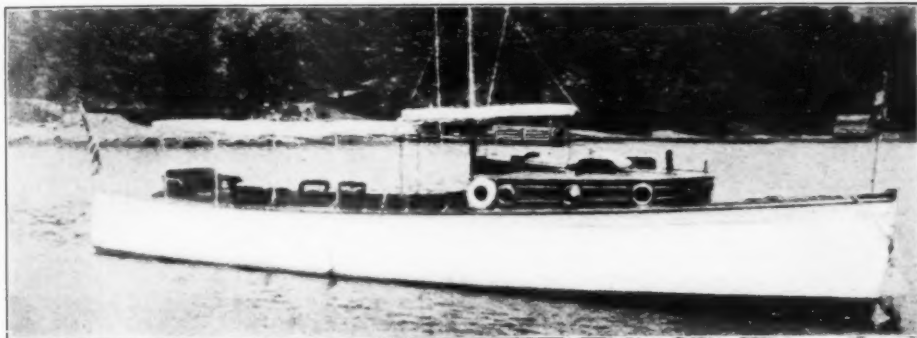
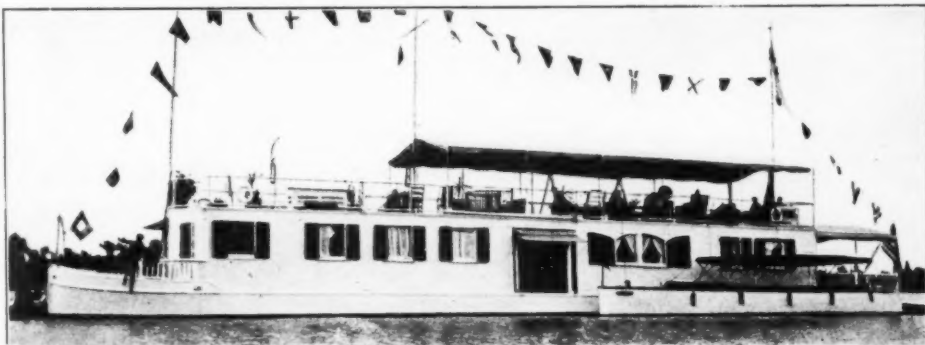
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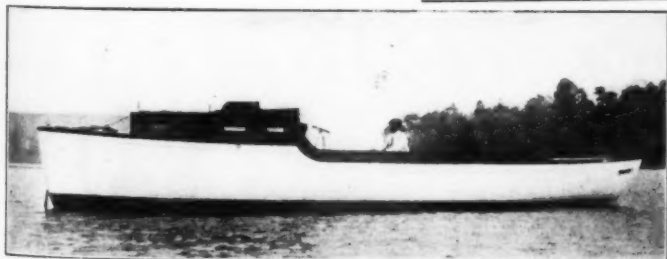
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No. 3496.—Bargain, as owner is building larger boat; comfortable and roomy furnished twin screw houseboat; 98 x 17.6 x 3 feet draught; built in 1907; main saloon 17 x 16 feet; 10 staterooms and bath; running water to all staterooms; separate tanks for drinking and washing water; electric lights, dynamo and storage batteries; upper deck 73 feet x 17 feet, 32 feet of which is covered by double faced awning. Four boats go with the houseboat, viz: 1 mahogany decked launch, 40 feet x 7 feet 6 inches, fitted with auto top and 35 H. P. Smalley engine, giving a speed of about 18 miles; 1 dory 16 feet with 3 H. P. Ferro special engine, and 2 Mullins steel boats, which are carried on davits. The main engines are two 25 H. P. horizontal opposed, new in 1910. A 4 H. P. Fairbanks engine is used to drive the water, air, bilge and fire pumps. Linen closets, 2 refrigerators, ice box (1 ton ice). Gielow & Orr, 52 Broadway, New York.



No. 2004.—For Sale.—High class day cruiser, in perfect condition; 45 x 7.5 x 3 feet draught; speed 12 miles; hunting cabin, full head room, lavatory and toilet; cockpit nearly 13 feet long; a 4 cyl., 4 cycle, 32 H. P. Speedway motor, located amidships; price less than half of cost; owner has larger boat. For particulars apply Gielow & Orr, 52 Broadway, New York.

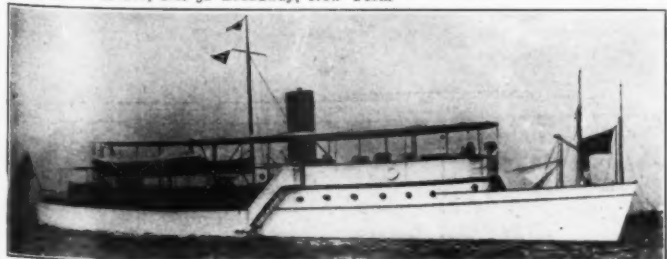
No. 3095.—For Sale.—Raised deck cruiser, Gielow design, 60 x 12 x 3 feet 2 inches draught; interior finished in mahogany with white ceilings. Accommodations for six and crew; three transoms in cabin; one double and one single stateroom, 2 toilets, 2 washrooms, crew forward; Lamb engine, 40 H. P.; Independent electric system; carpets, curtains, cushions, awnings; engine only used one season. Gielow & Orr, No. 52 Broadway, New York.



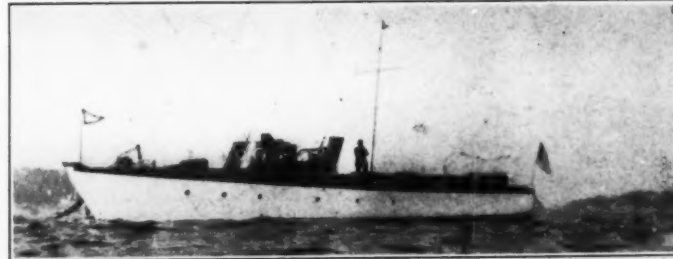
No. 2981.—For Sale.—Excellent day cruiser, 32 x 8 x 2.5 feet draught; Gielow design; cabin 6 feet; toilet and lavatory; cockpit 13 feet long; 2 cylinder, 4 cycle motor. Gielow & Orr, No. 52 Broadway, New York.



No. 3407.—Attractive 40 ft. motor boat, launched late 1910; new 24 H. P. Lamb engine just installed; one man control; electric lights; new cedar dory, double stateroom and saloon; complete equipment. Gielow & Orr, 52 Broadway, New York.



No. 1406.—For Sale.—92 foot sea-going cruising yacht; 20th Century motor; best furnished and fitted yacht of her size on the coast. Gielow & Orr, No. 52 Broadway, New York.



No. 1575.—Sacrifice; immediate sale; fast seagoing motor yacht; 74 x 10 x 3 feet draught; speed up to 15 miles; motor 6 cylinder "Speedway" 60 H. P., new 1911; main cabin, two staterooms, galley; deck control. Gielow & Orr, No. 52 Broadway, New York.

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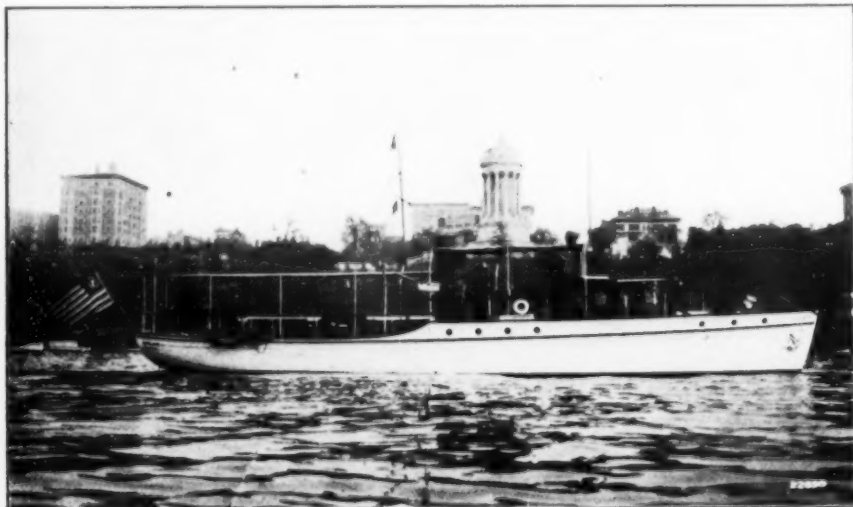
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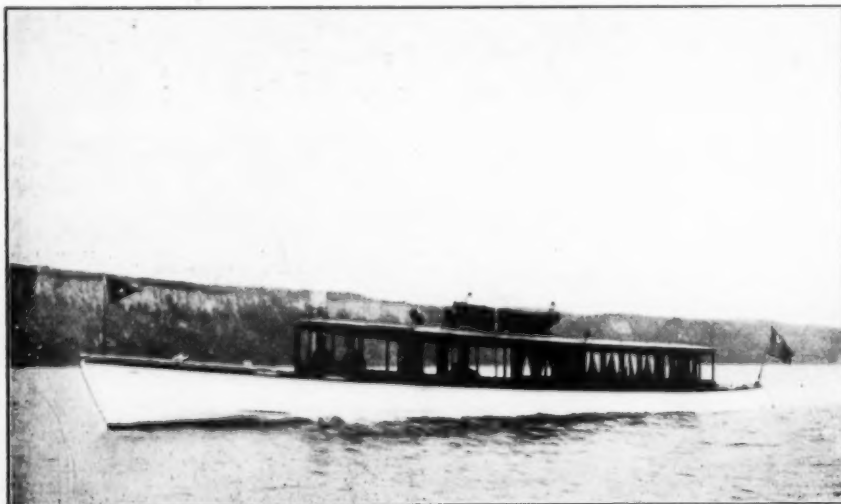
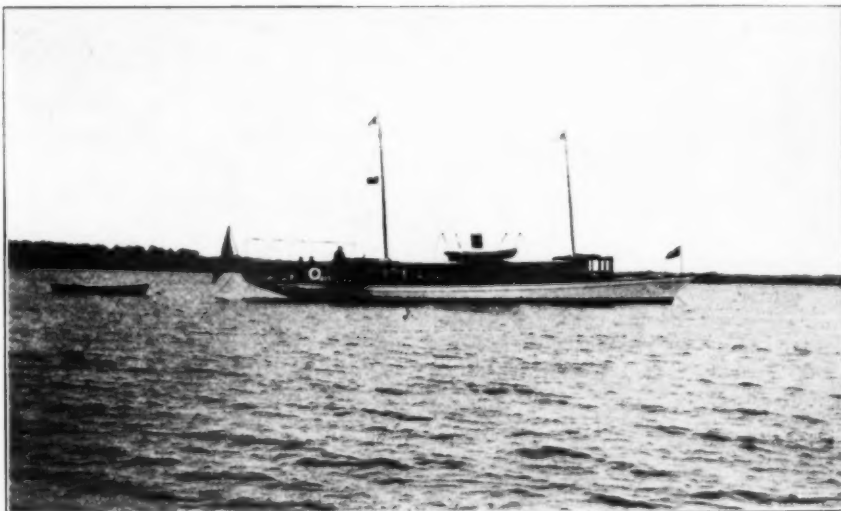
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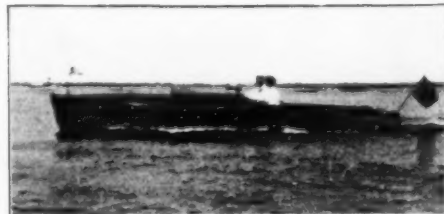
No. 3556.—For Sale.—One of the most successful and desirable motor yachts of its size. 75 x 13.6 x 4 ft. draught; built 1911; twin screw; two 4 cylinder, 4 cycle engines, 30 to 40 H. P. each; speed up to 11½ knots; extra heavy construction; practically no vibration; crew's forecabin, captain's stateroom, storage space and galley below forward; engine room amidships, with gasoline tank on each side; also independent direct connected electric generating set. Forward and aft of engine room are watertight bulkheads. Next aft are two guests' staterooms with wide berths, wardrobes, bureaus, etc. A short passage follows with bath room to port, and companionway and large storage locker to starboard. Aft again is large owner's stateroom with wide berth, lounge, toilet, washbowl, bureau, wardrobes, etc. Dining saloon in deck house, 12 ft. long with transom each side and sideboard at after end; also short stairway to galley. Interior finish of deck house and after quarters is mahogany throughout; also the hatches, skylights, etc. The yacht is most elaborately and attractively equipped for cruising. Outfit includes power launch and dinghy. Engines have three sets of ignition. The yacht is laid up near New York. Plans, full particulars and inspection permit from Gielow & Orr, 52 Broadway, New York.

No. 2080.—For Sale.—Fast twin screw cruising launch, 79 x 12 x 3 ft. 6 in. draught; speed up to 12 miles; designed and built by Seabury; copper fastened; flush decks fore and aft; pilot house, saloon, stateroom and smoking room, mahogany finish; 6 feet 5 inches headroom in cabin, 7 feet in pilot house; sleeping accommodations for five in owner's party, and 4 in crew. Power plant consists of two 50-60 H. P. 6 cylinder "Speedway" engines, new in 1910; dynamo and storage batteries for lights. Is an excellent seaboat; has always had the best of care. The joiner work throughout is of hard woods. Drop plate glass windows in pilot house and cabins; good toilet and galley arrangements. Heavy storm shutters with port holes cover pilot house windows in bad weather. Spring 1911 had new storage batteries, propellers and shafts. Plans and permit for inspection apply to Gielow & Orr, No. 52 Broadway, New York.

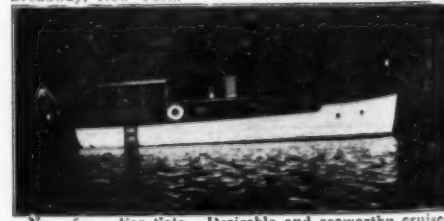


No. 2917.—For Sale.—Excellent craft for fast ferry service; twin screw; 60 feet o. a.; speed up to 24 miles; designed and built by Seabury; two 100 H. P. "Speedway" motors; double cedar planking; the joiner work throughout is mahogany; requires but three men to manage; is as good as new, and for sale at a great bargain. Gielow & Orr, No. 52 Broadway, New York.

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No. 3478.—For Sale.—Speed 15 miles; 25 feet o. a., 4 feet beam; double planked, copper fastened; 4 cylinder 16 H. P. Rochester motor; "Every-ready" starting device, engine starting upon pressing a button; Atwater-Kent ignition; Patterson waterproof battery box containing twelve cells; Grey-Hawley spark and throttle control; all fittings are of brass. Gielow & Orr, 52 Broadway, New York.



No. 2694.—For Sale.—Desirable and seaworthy cruiser, 39 x 9 x 3.6 draught; cabin, stateroom, engine room; 18-25 H. P. Standard motor; electric lights, etc.; gasoline tanks under seat in cockpit; engine control at wheel at after end of cabin. Gielow & Orr, No. 52 Broadway, New York.

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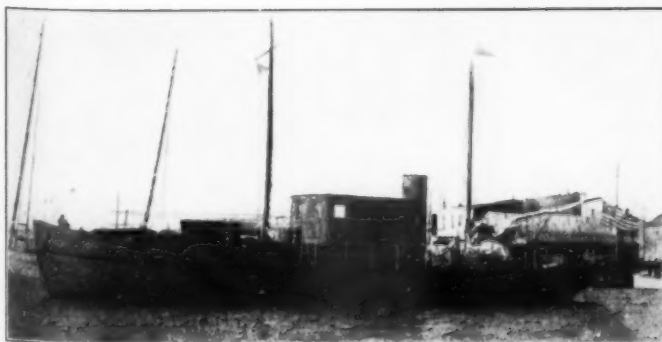


No. 3475.—For Sale—Keel, cruising and racing sloop; 60 x 38.4 x 11.4 x 7.10 ft. draught. Our design; built 1909; oak frames, double planking, cedar inside, mahogany outside; copper fastened. Best possible construction; narrow trunk cabin and cockpit; main cabin 7 ft. 9 ins. long; 6.2 ft. headroom with two transom berths, etc. Interior finish, white mahogany trim. Owner's stateroom aft with two berths. Toilet room, galley, forecabin with three berths and toilet. Completely and handsomely finished for cruising, below and on deck, including electric lights, full suit of working and racing sails, round bottom dinghy, etc. Price, etc., Gielow & Orr, 52 Broadway, New York.

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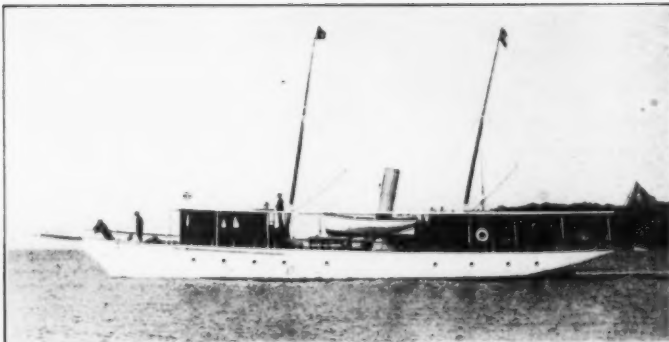
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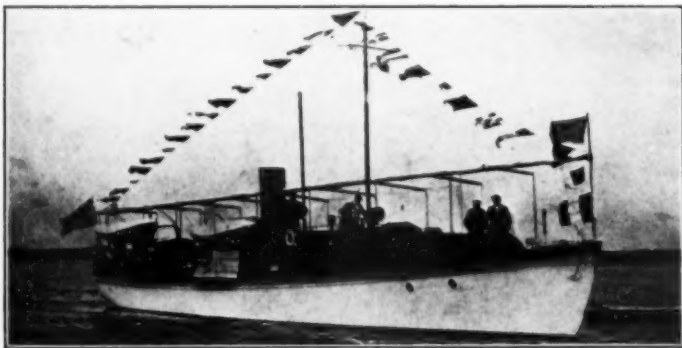
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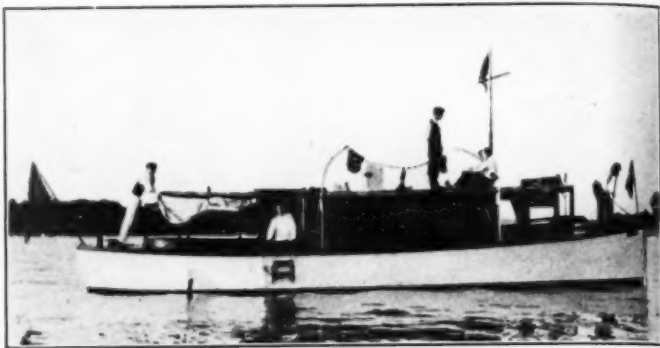
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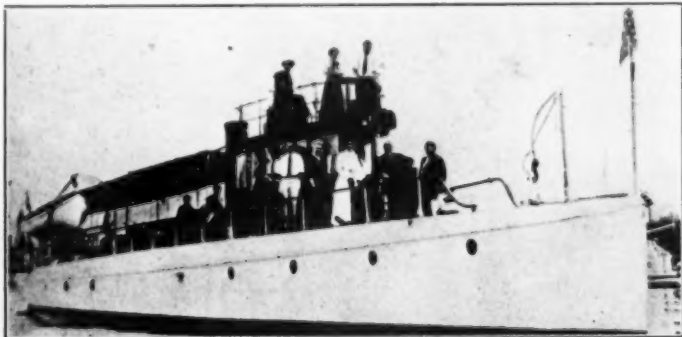
No. 3166.—For Sale, may charter—owner has larger yacht. Beautifully kept up, twin screw motor yacht, 93 x 86.9 x 13.6 x 4.8 ft. draught. Built by well-known concern for present owner. Large after and bridge decks. Roomy owner's stateroom forward with bathroom connecting. Amidships is machinery space, with gasoline tanks aft, followed by galley, guests' toilet-room, and large main cabin with wide transom on each side, buffet, lockers, etc. Two 100 H. P. 6 cylinder Standard engines; speed 12 to 14 miles. Equipment is very complete, including independent electric light outfit. Interior and exterior, mahogany. Bottom copper sheathed. Price, plans, etc. Gielow & Orr, 52 Broadway, New York.

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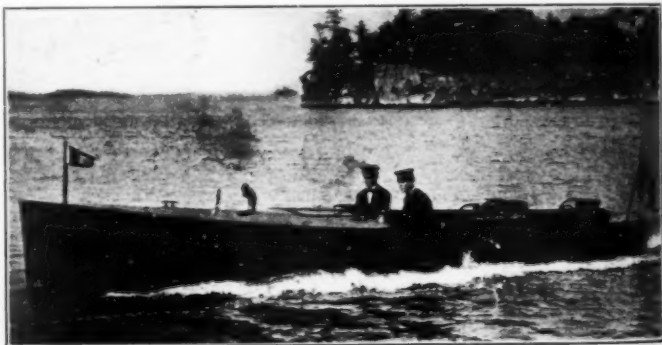
No. 2628.—For Sale—A handsome and up-to-date model; 42 ft. x 10 ft. x 3.6 ft. Cabin 20 ft. long with 6 ft. 2 ins. headroom; sleeping accommodations for six; dynamo and storage battery; engine 4 cylinder, 24 H. P. Good inventory, including 10 ft. bright cedar dinghy. Gielow & Orr, 52 Broadway, New York.

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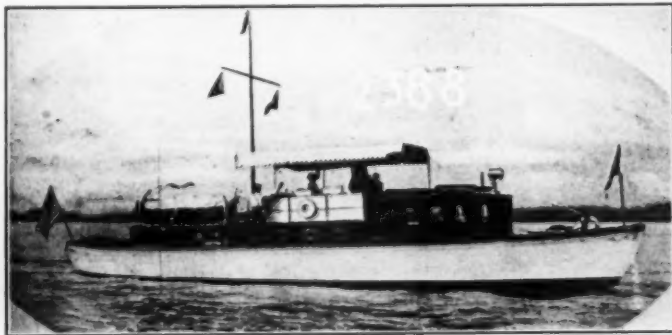
No. 1000.—For Sale—Cruising power yacht, 112 x 12.6 x 4 ft. draught. Five double and two single berths; shower bath. The 100 H. P. engine gives her a cruising speed of 13 miles. Inventory practically complete, including 15 ft. mahogany launch and 17 ft. cedar skiff. Yacht in excellent condition. Can be run with small crew. For further particulars and inspection permit, write Gielow & Orr, 52 Broadway, New York.

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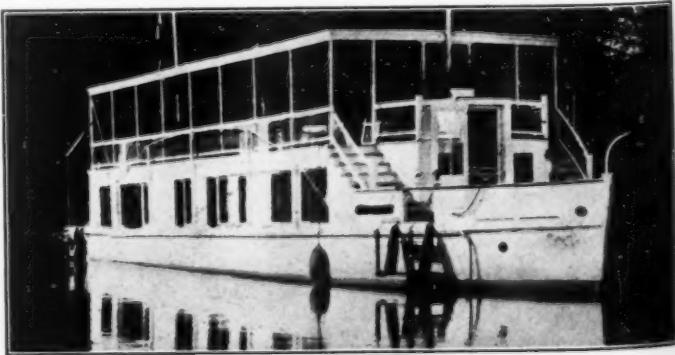
No. 3283.—For Sale—Very fine launch, 32 x 6 ft. Mahogany decks, built for comfort; especially strong engine foundation; no vibration; speed 18 miles; comfortably seats 8 persons, each wicker chairs. Equipped with air tank, will float three people easily. Engine 24 H. P. forward under hinged hood. Automobile top and full equipment. Electric running lights. All salt water fittings. Gielow & Orr, 52 Broadway, New York.

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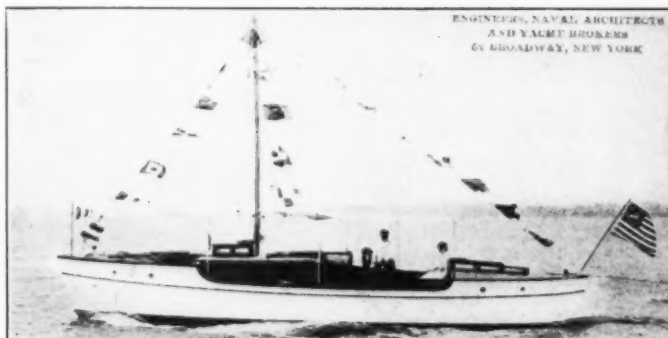
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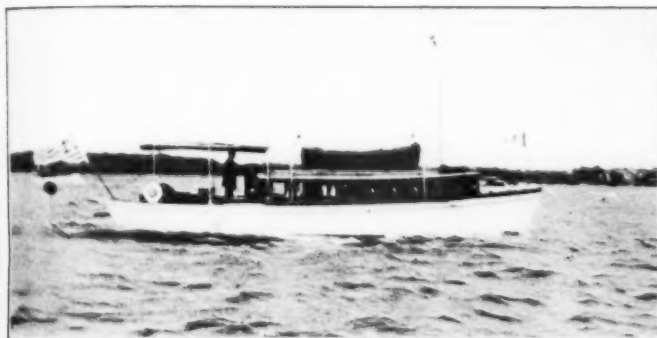
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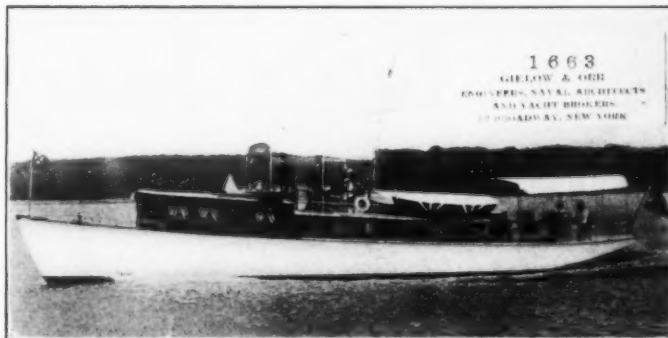
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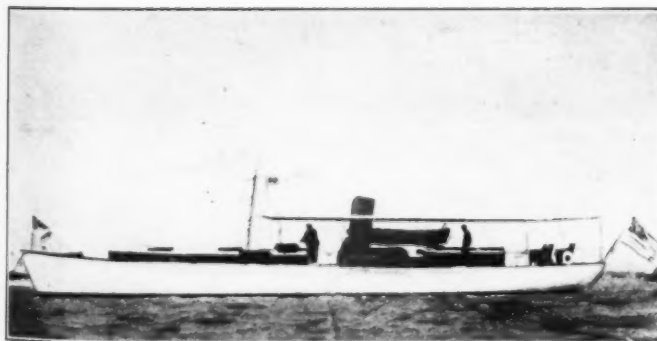
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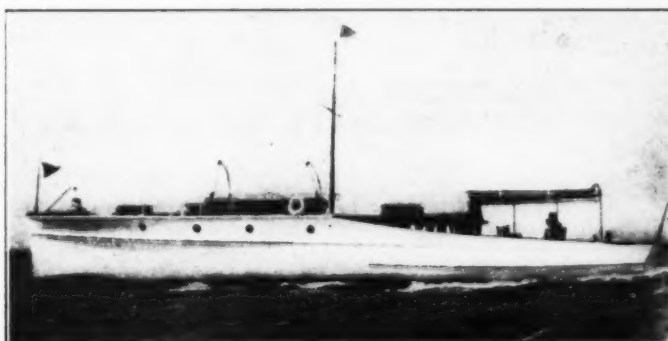
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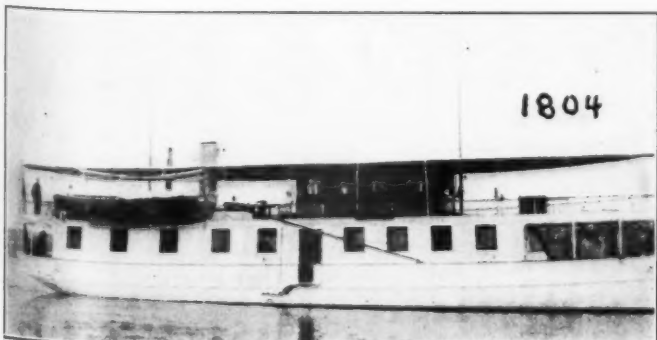
No. 1663.—Sale, charter, 65 ft. twin screw; comfortable cruiser.
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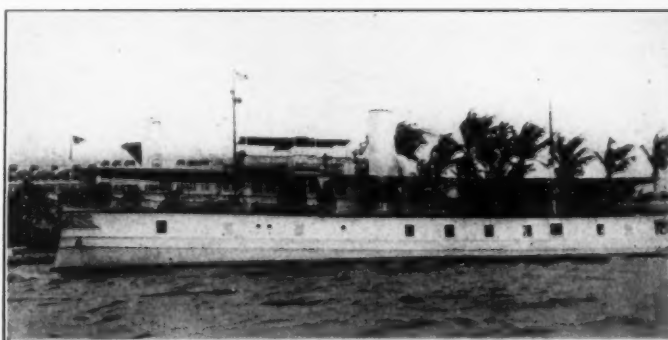
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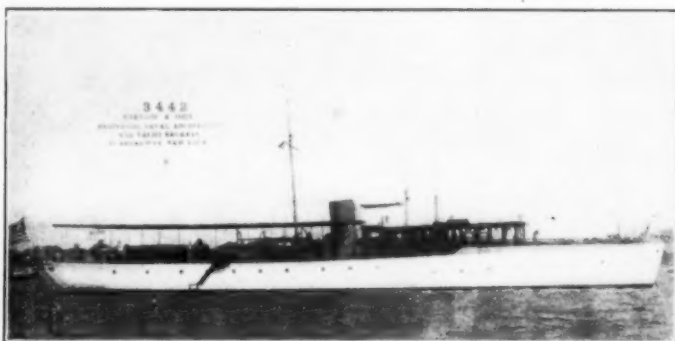
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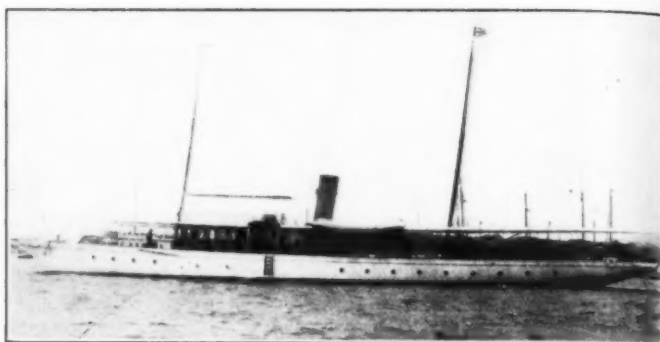
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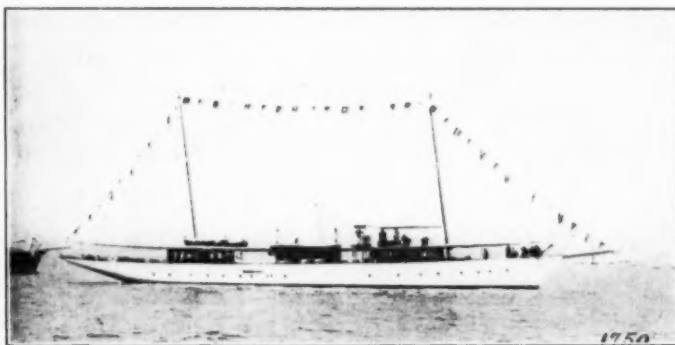
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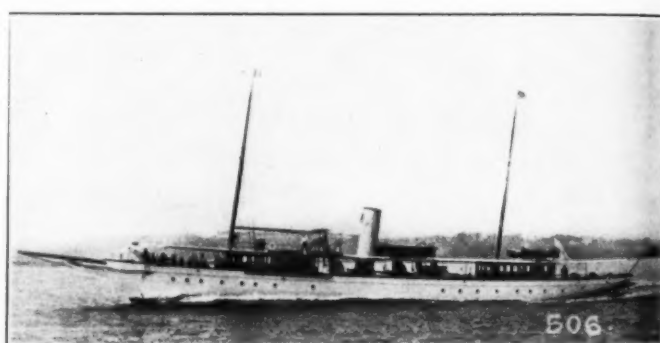
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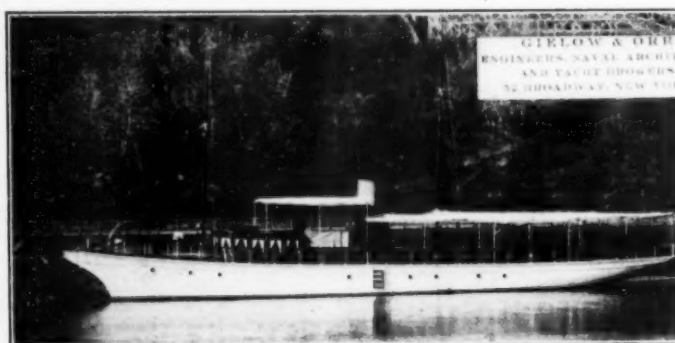
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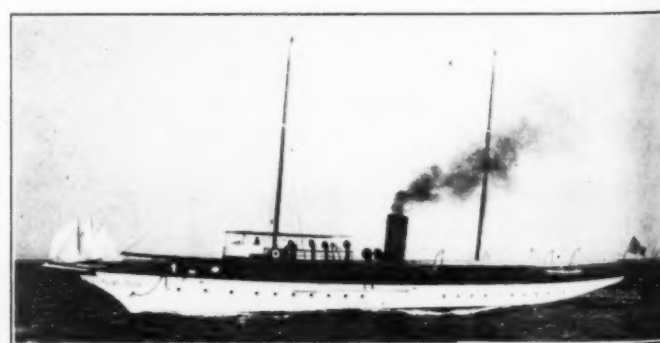
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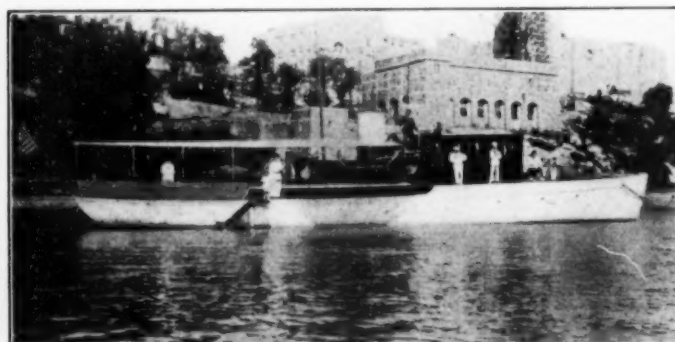
No. 506.—Bargain; 178 feet, 17 knots, 5 staterooms.
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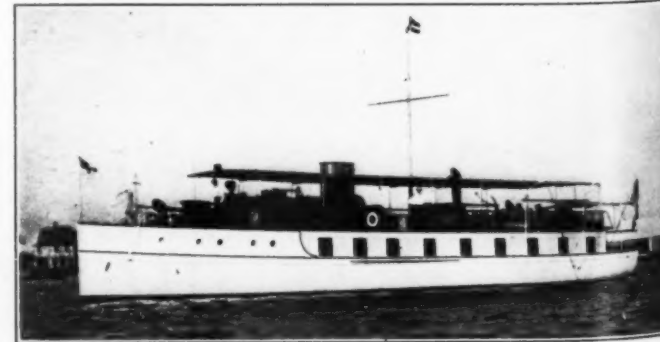
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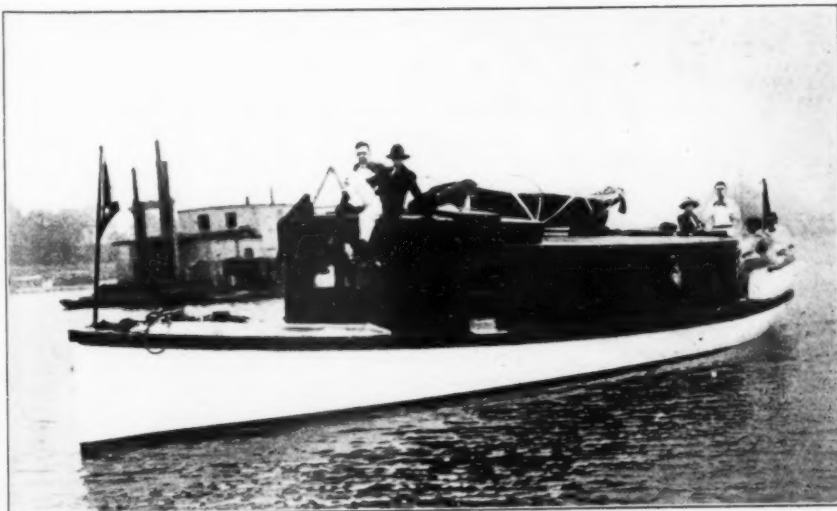
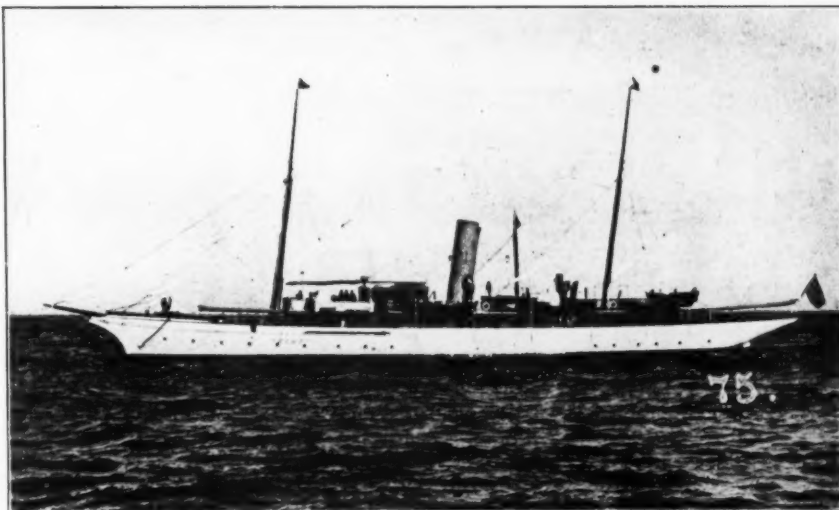


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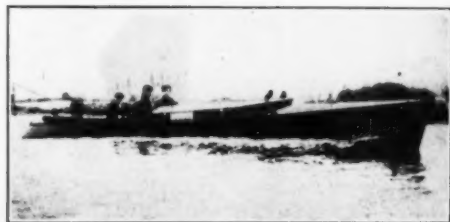
No. 75.—For Sale—Bargain, or will charter. American built, steel, ocean-going steam yacht; 198 x 174 x 24.5 x 12 ft. draught. Speed 12½ knots. Superior seaboat. Upper deck about 110 ft. in length; forward end of deckhouse contains dining saloon, pantry and galley. Smoking room on deck aft. Crew below, forward. Next aft are two guests' staterooms, main saloon, bathroom and storeroom. Aft are two extra large staterooms for owner, two bathrooms, maid's room and guests' double stateroom. Triple expansion engine, four boilers, large coal capacity. Yacht has cruised abroad. Well kept up. All modern conveniences. Excellent inventory. Plans, etc., Gielow & Orr, 52 Broadway, New York.

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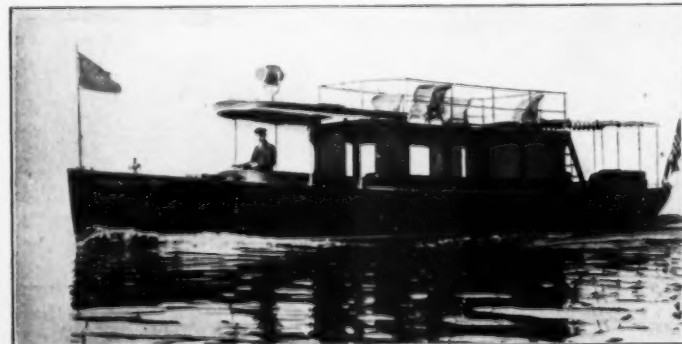
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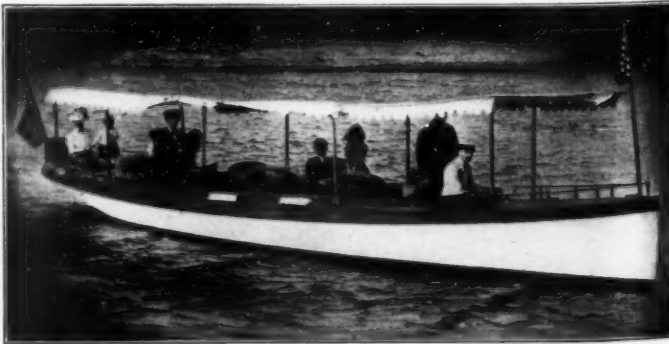
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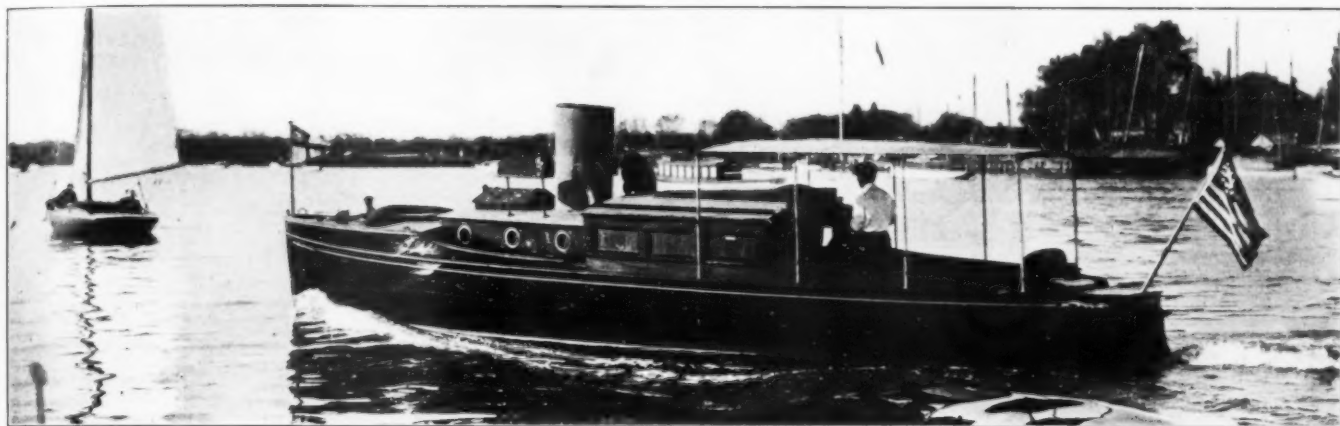
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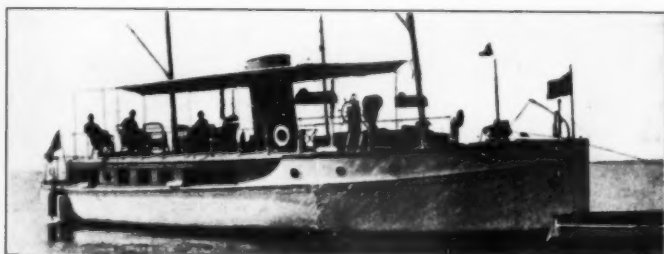
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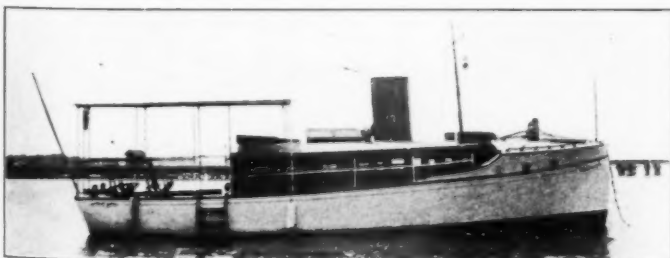
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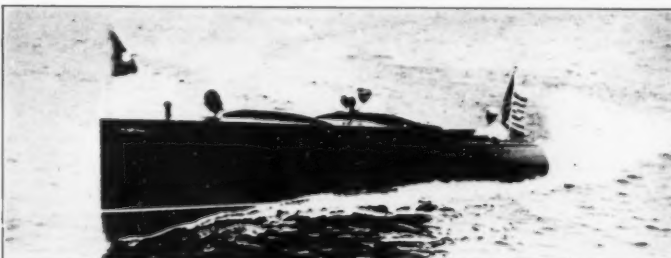
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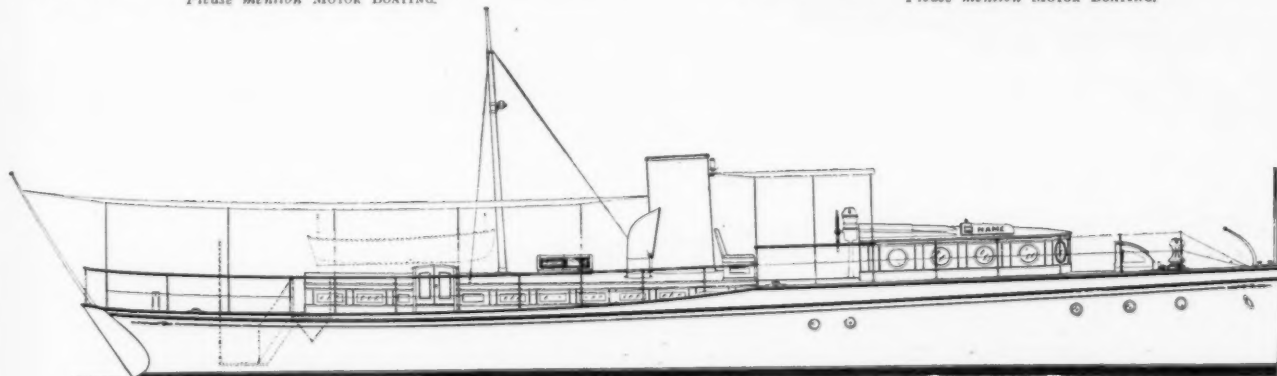
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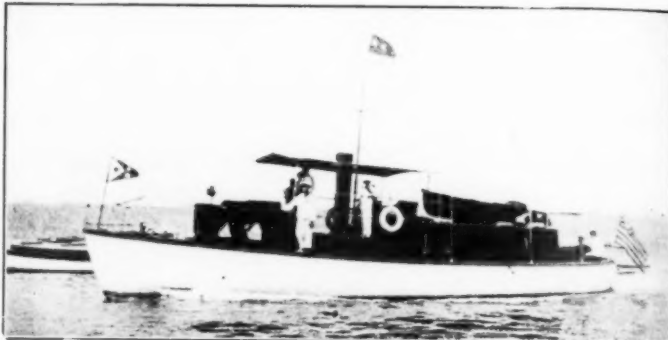
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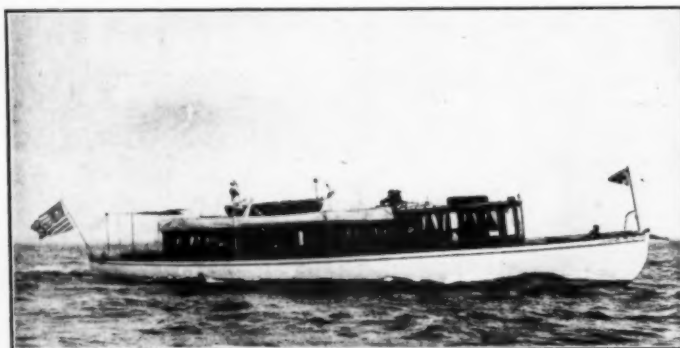
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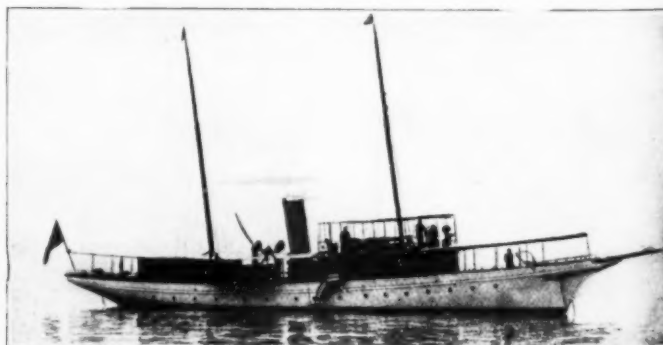
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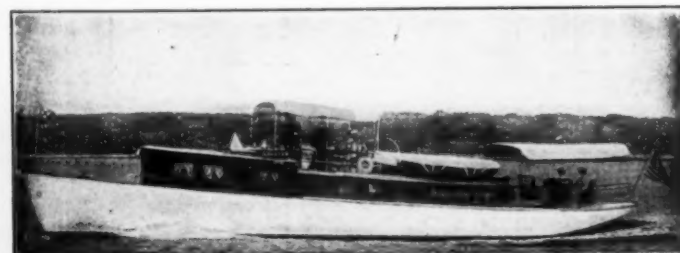
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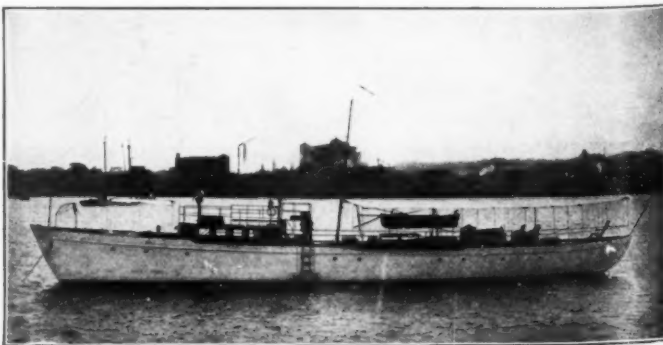
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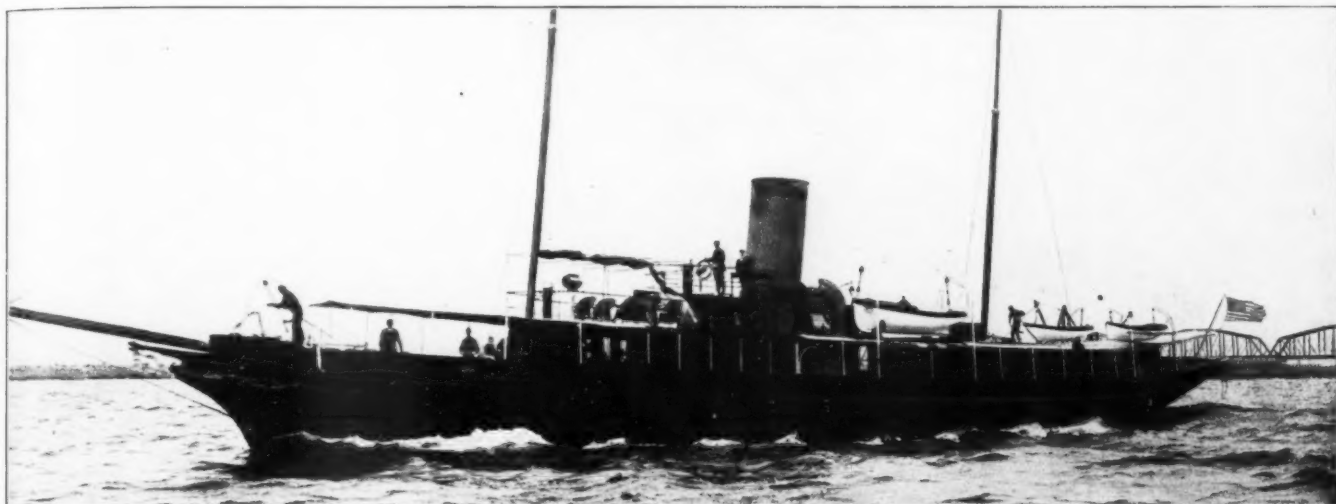
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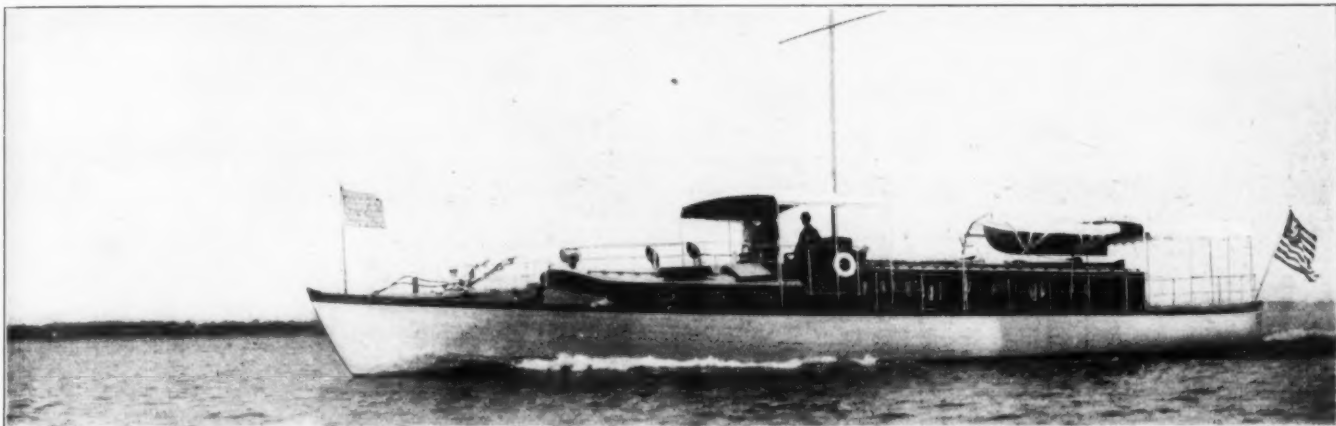
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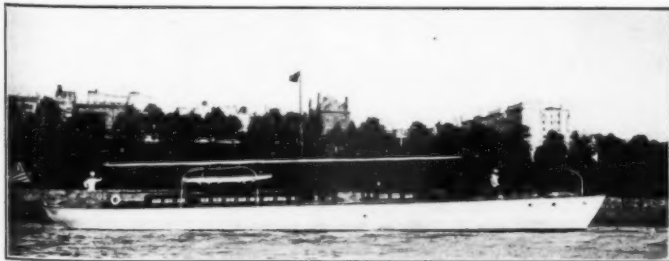
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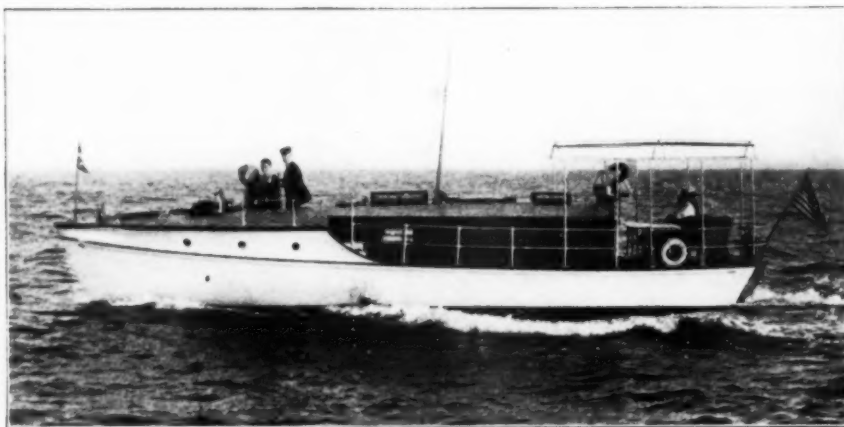
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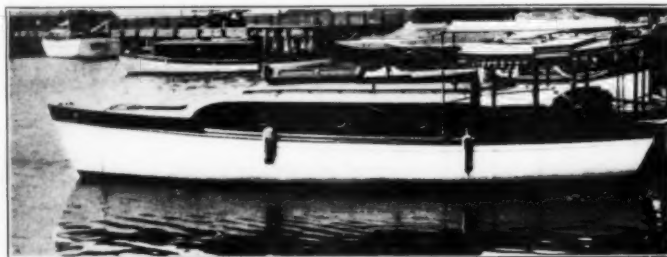
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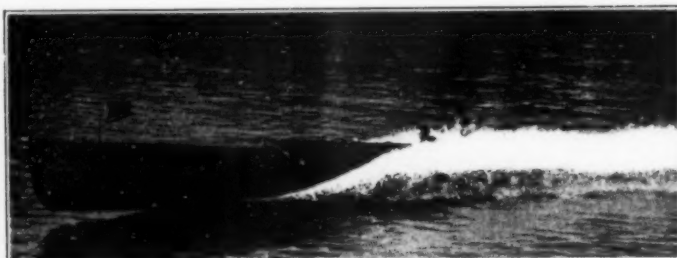
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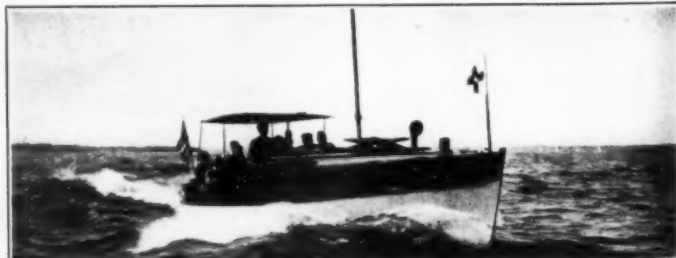
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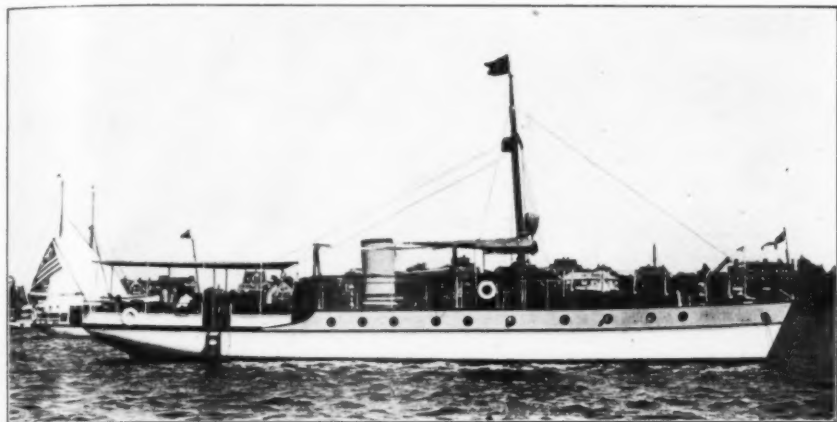
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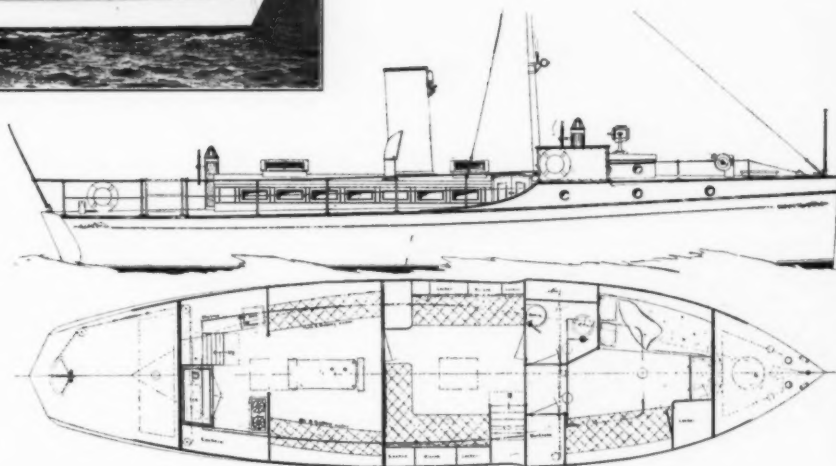
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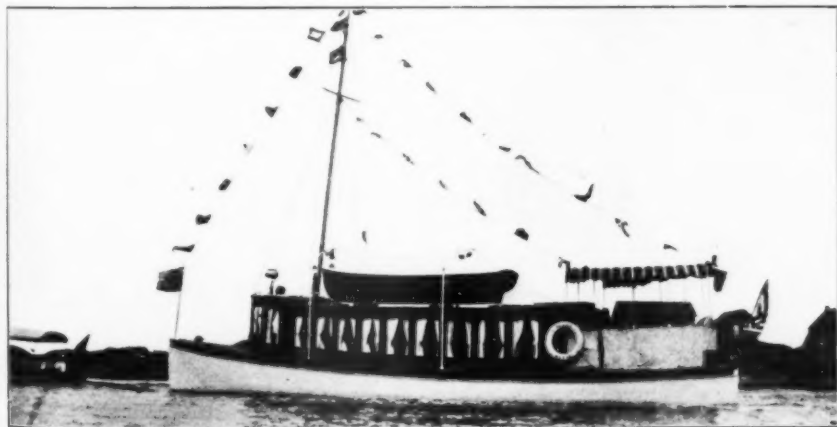
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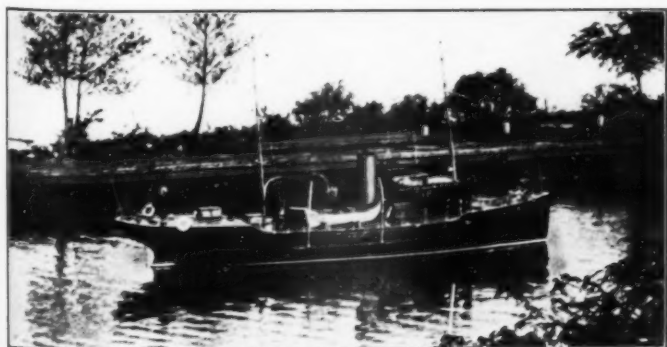
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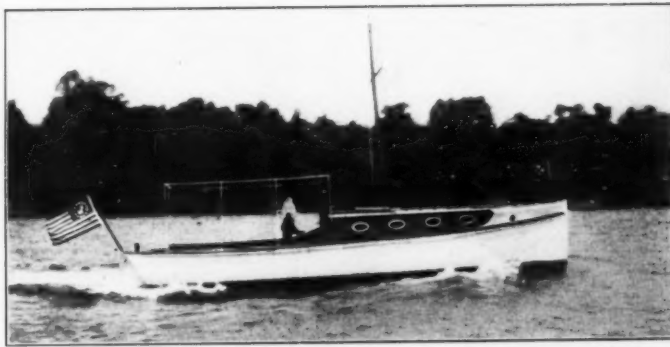
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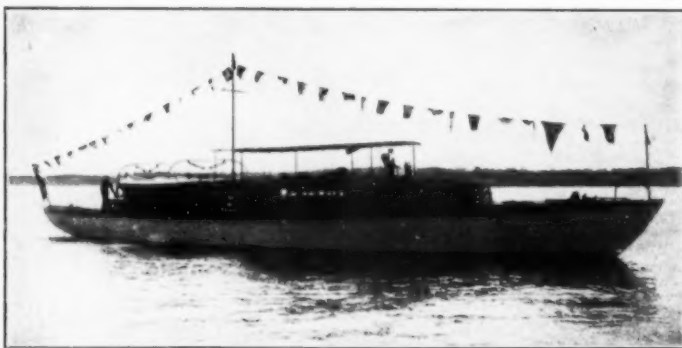
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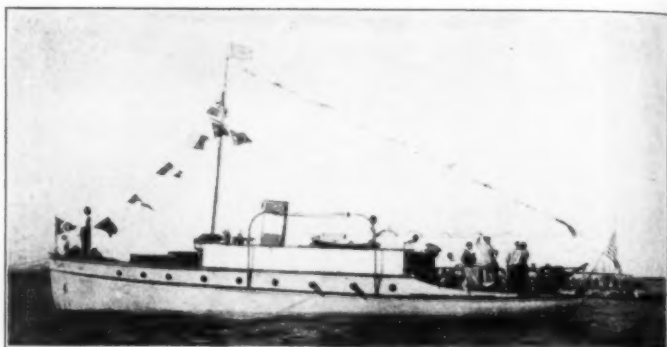
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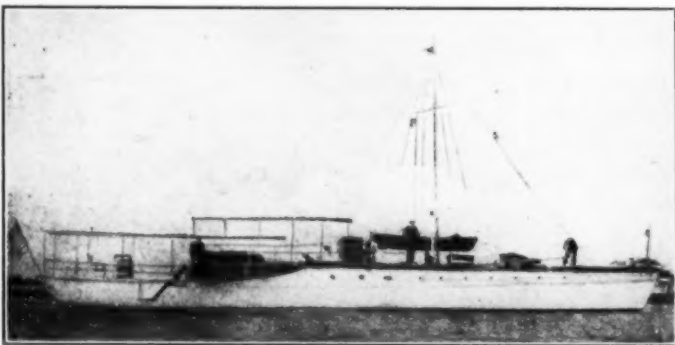
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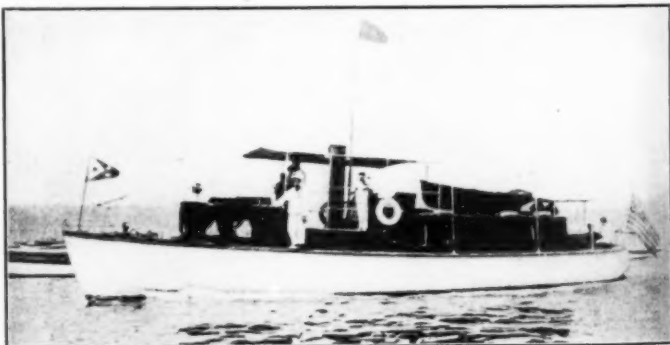
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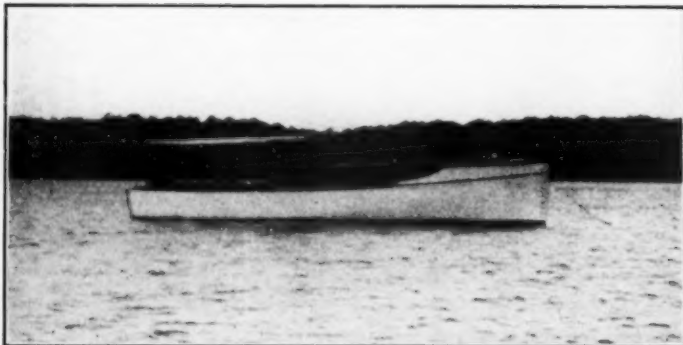
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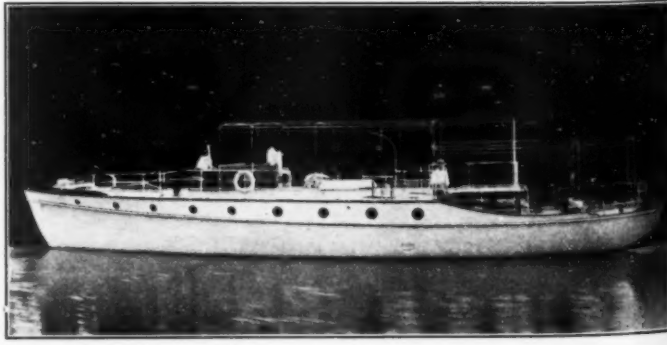
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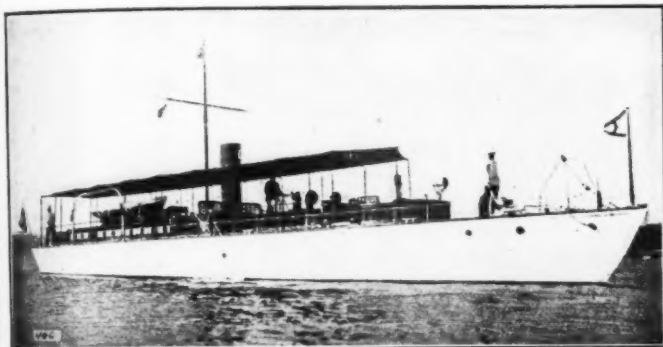
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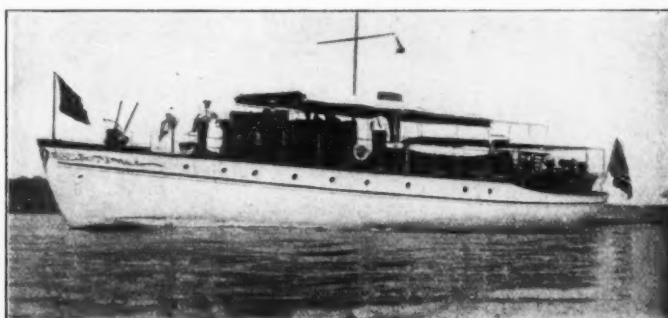
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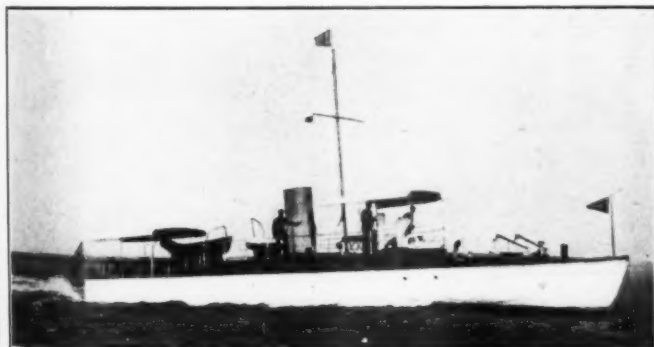
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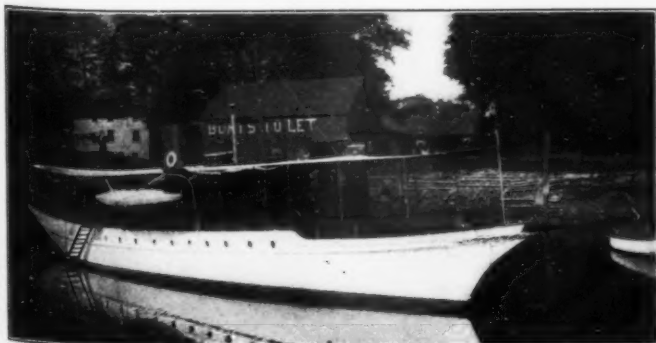
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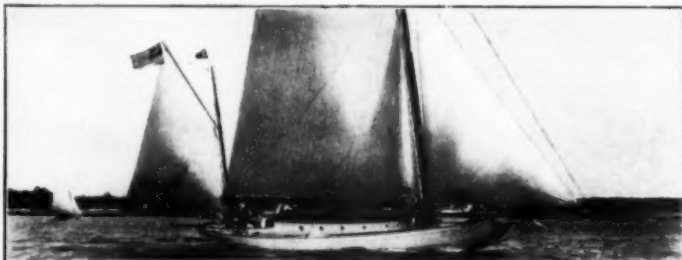
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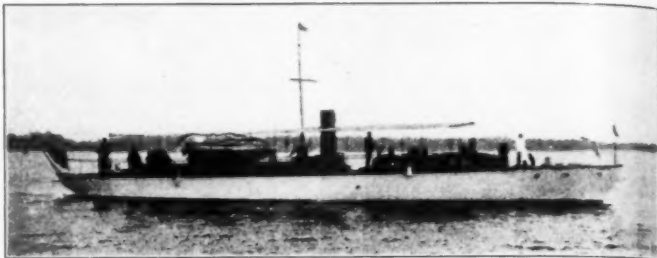
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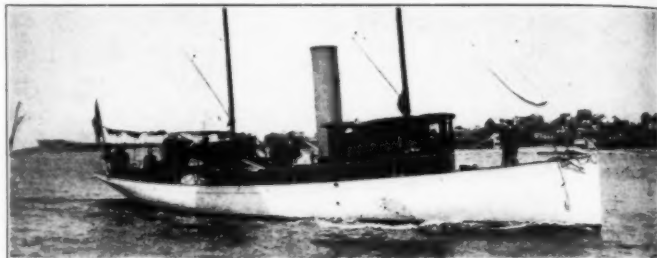
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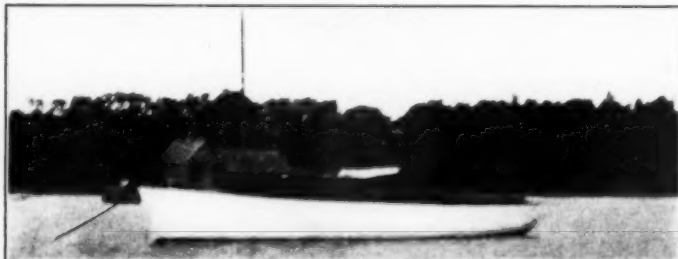
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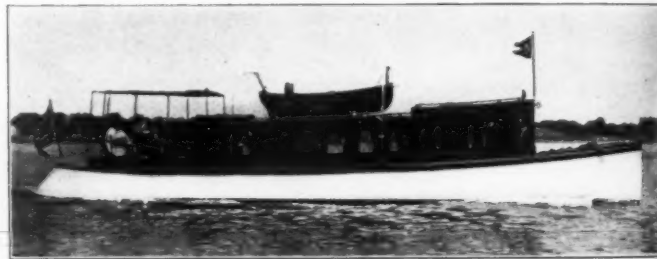
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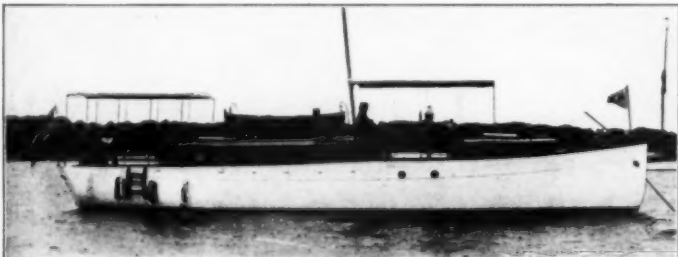
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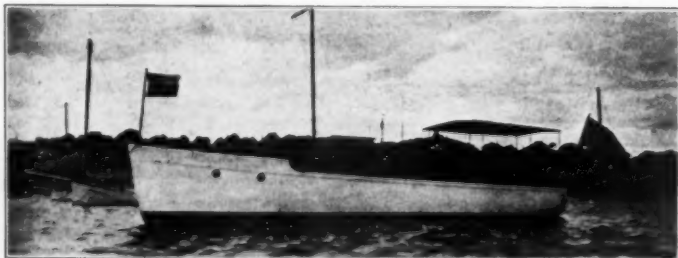
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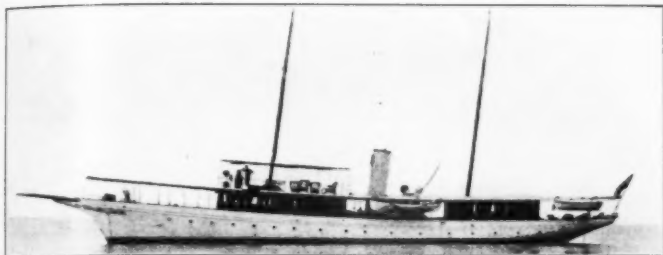
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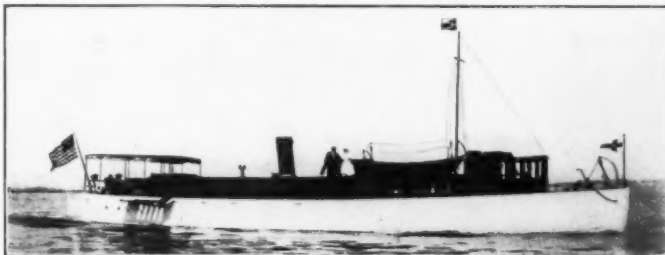
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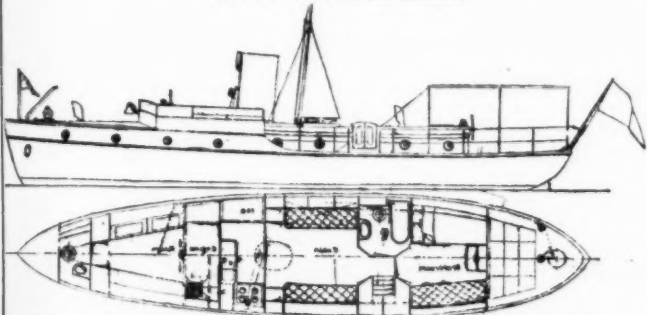
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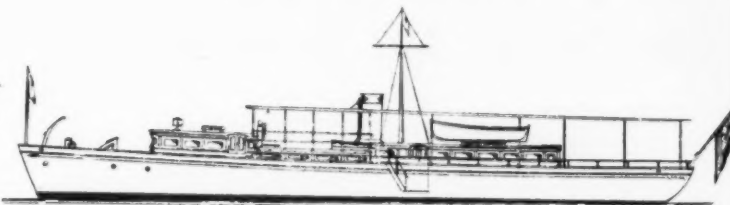
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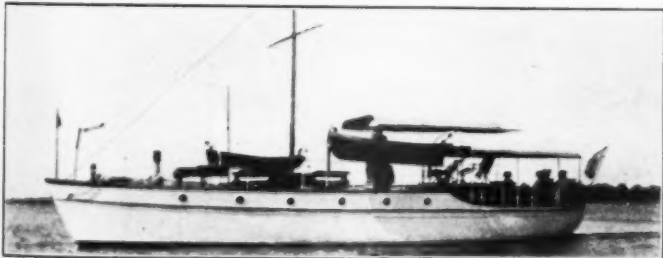
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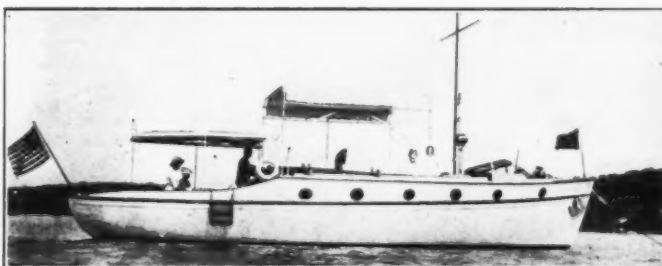
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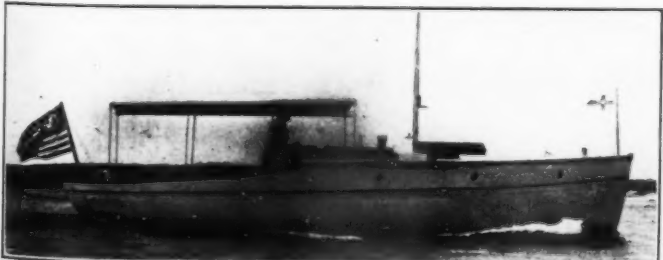
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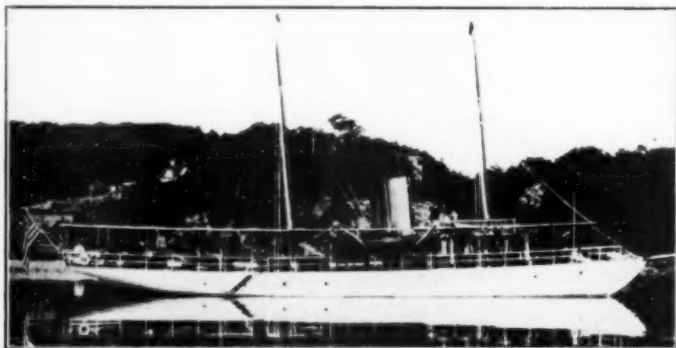
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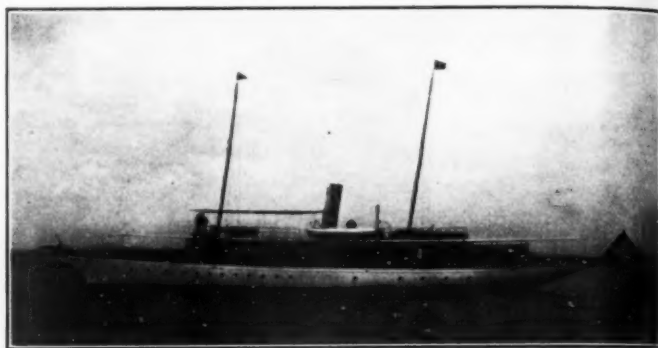
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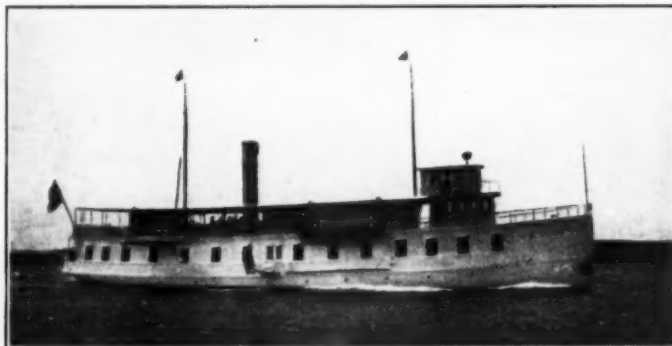
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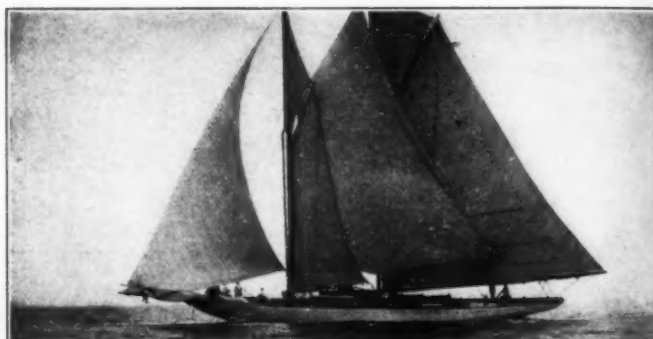
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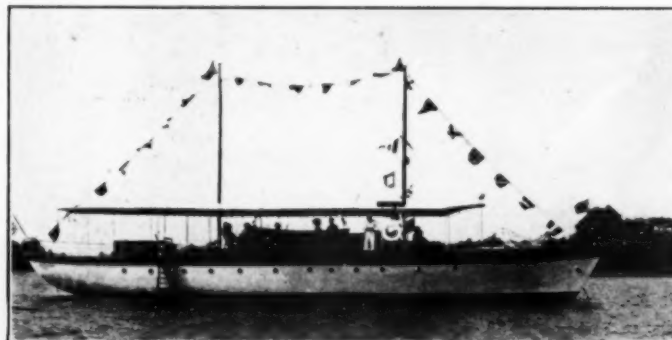
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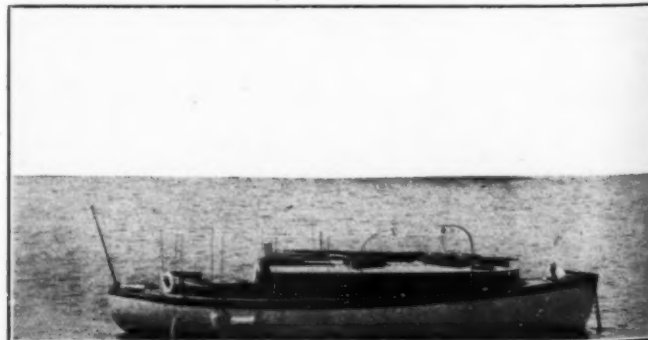
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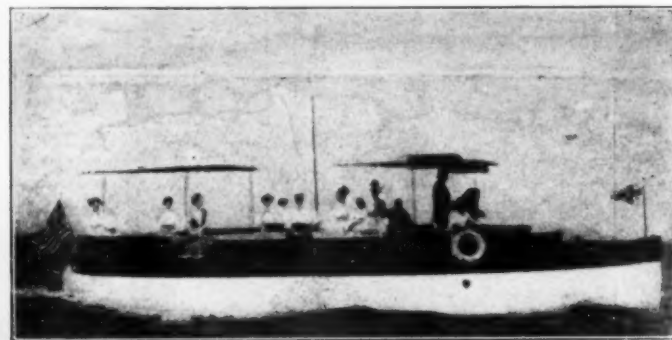
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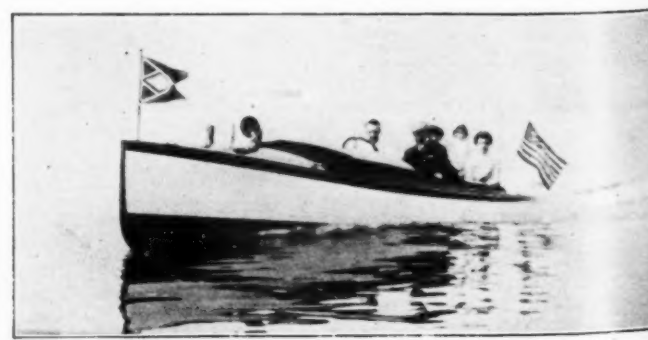
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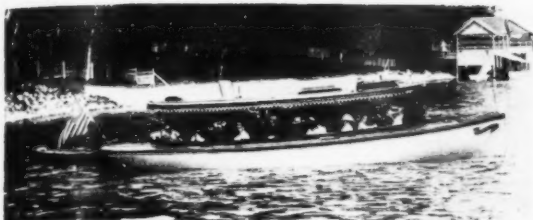
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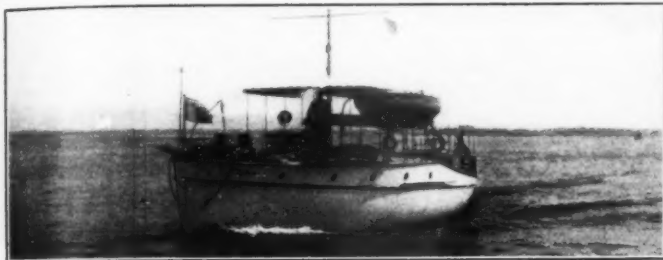
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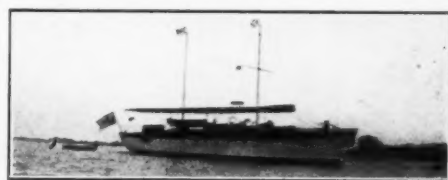
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 NEW YORK SALESDROOM
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EVINRUDE MOTOR CO.

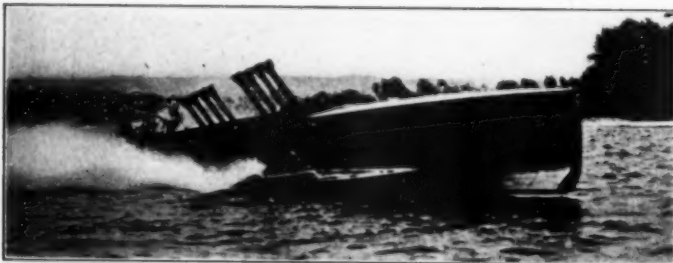
282 Reed St.
 MILWAUKEE, WIS.

THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
 Cut one inch deep, one column wide..... \$2
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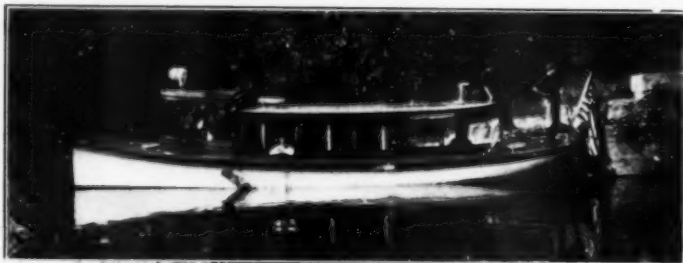
Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention Motor Boating.



For Sale—Fauber Hydroplane, Red Top III. In A 1 condition. See description in MOTOR BOATING. The Kent Marvin Co., Bellingham, Wash.

A COMFORTABLE BOAT at a reasonable price. For river and lake use no type is so pleasurable as the full cabin launch. Full head room in the pilot house, and two comfortable seats with unobstructed view ahead even in the worst weather. Absolutely reliable engine which will run all day without attention. Boat can be seen at Morris Heights. Robert L. Niles, 20 Broad Street, New York.



ATTRACTIVE CABIN CRUISER, 36 x 8 ft.; copper riveted; fine sea boat; 21 H. P. 3 cylinder 2 cycle Kahlenberg engine; battery and magneto; starts automatically without cranking. Reversible engine; friction clutch; golden oak paneled cabin. Sand's closet and folding wash stand; leather cushions, brass lights, etc. Fully equipped and in perfect condition; copper fuel tank of 250 gallons; speed 10 miles per hour. Could not duplicate boat for \$3,000. Now in Sturgeon Bay, Wis. Delivered within reasonable distance for \$1,400. F. J. Cabot, 6995 Washington Ave., St. Louis, Mo.



FOR SALE—Raised deck cruiser, 40 x 9 x 3, 25 H. P. Ferro and reverse gear, magneto supplying ignition, search light and cabin lights, Sands toilet, gasoline stove, washbasin, cushions. Boat strongly built, very seaworthy, two seasons old, galvanized and copper fastenings, motor overhauled by manufacturers, everything in first class condition, emergency spar and sails. For further information and price, address N. Lapierre, Matane, Prov. Quebec.

FOR SALE at reasonable price, one 300 H. P. six cylinder single acting reversible Standard engine. Has been in use one year and better than new. Reason for sale, am manufacturer of marine motors and am changing Standard for my own make. Also have one Standard lighting outfit in A1 shape. Will sell both together or separately as purchaser may require.
 W. E. SCRIPPS,
 SCRIPPS MOTOR CO.,
 631 Lincoln Ave., Detroit, Mich.

LAUNCH, 25 x 6, ignition outfit, 9 H. P. motor, reverse propeller, ready to run. New condition, used one season. Running lights, twenty life preservers, cushions and canvas cover. Suitable for small passenger boat or family use, seats 20. Bargain. Bruce W. Mason, Richmond, Mich.

FOR SALE—Complete patterns of a powerful Marine Engine, 5 x 5 in., two cycle, three port, 9 to 10 H. P. and 18 to 20 H. P. Res. single and double cylinder. H. F. Clifford, 32 So. State St., Concord, N. H.

CONTINENTAL Boat Works (Special). Best boat ever offered for the money; 22 x 5 feet; 5 H. P. engine; white oak frame; cedar planking; good for thirty years; \$250. Continental Boat Works, 1112 Mt. Elliott Ave., Detroit, Mich.

WANT to buy the best second-hand boat that I can use as a houseboat, from 45 to 60 feet long, from \$500 to \$700. Charles H. Klimper, 17 West 38th St., New York City.

FOR SALE—30 H. P. heavy duty engine and all equipments, excellent condition; a bargain. J. A. Jacobson, Courtland Beach, Omaha, Neb.

BARGAINS in Palmer motors, factory rebuilt and guaranteed. E. E. Palmer, 31 East 21st St., City.

USE "SNAPPER" ENGINES for your small boats. They are a big little engine, built by The Automatic Machine Co., Bridgeport, Conn.



FOR SALE—This high class passenger steamer, twin screw; 73 x 15; carries 200 passengers; a bargain. A. L. Hamill, Petoskey, Mich.

NEW 54 H. P., six-cylinder Elbridge engine, just from factory. Aluminum manifolds, base and cylinder heads, extra finish throughout. Built for Mr. Coleman du Pont of Wilmington, Del.; exchanged for a larger power. Price \$700. Emerson Engine Co., Alexandria, Va.

FOR SALE, CABIN CRUISER.

57 feet long, 9 ft. beam; Barber 40 H. P. engine, 1 man control; fully equipped and well designed. Apply to builder, Fitz M. Hunt, Alexandria Bay, St. Lawrence River, New York.

A BARGAIN: Two 4 cylinder, 2 cycle, 50 H.P. Gasoline Engines, complete from Propeller to Fly Wheel, in excellent condition. Fitted with Bosch Magneto, Lavigne Oilers, Heinz Coils, Reverse Gears, etc. Set up ready for inspection. Owner purchased larger engines. Will sell one or both. Price \$375.00 each, F. O. B. Detroit, Mich. Apply C. W. Kotcher, 639 Gratiot Ave., Detroit, Mich.

BROKEN cylinders and other automobile parts of cast iron and aluminum made good as new by autogenous welding at about one-fourth cost of new ones. Shipment made within 24 hours from arrival. Guarantee, references and indisputable evidence for the asking. Waterbury Welding Works, Waterbury, Conn.

NO. 1760.—For Sale—32 x 7.4 ft. raised deck cruiser; large cockpit. Built 1909. Speed 8 miles; 12 H. P. Lathrop motor. Accommodations for two; toilet, etc. Handsome model. Excellent condition. Apply to Cox & Stevens, 15 William St., New York.

FOR SALE CHEAP—Toledo 12 H. P. two cylinder engine. Two cycle, two port type. Cylinders 4½ x 4½ inches. Bare engine only. Make us an offer or write for price. H. B. Gleason, Madison, Wis.

WANTED—Morris Heights Naphtha Launch, about 20 ft. Address T. K., Motor Boating.

FOR SALE—26 ft. launch, equipped with 12 H. P. Gray motor. Now at Lake George. Address R. C. Tefft, Hudson Falls, N. Y.

Third Annual Magneto Bargain Sale

Imported High Tension Magnetos at Less than Cost of Importation

Our third annual genuine inventory sale of U. & H. Master Magnetos, made in Germany, is now in progress. All H.P. sizes and types for 1, 2, 4 and 6-cylinder motors, suitable for motor cars, motor wagons, motor boats, motor cycles, stationary engines, etc. Write now, before they are all gone, for circular and price list. The sale is a real Magneto money saver.

J. S. BRETZ COMPANY
 250 West 54th Street, New York



FOR SALE OR CHARTER—70 ft. raised deck cruiser. Twentieth Century motor. Price low. Inquire Morgan Barney, 29 Broadway, New York.

SCORED cylinders repaired, \$8 each. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. Better investigate and save money. References, testimonials and full details on request. Waterbury Welding Company, Waterbury, Conn.

WANTED—24 H. P. heavy duty Buffalo. I have an 18 H. P. heavy duty Buffalo and a 21 H. P. Grey for sale or exchange. Chas. Bimbo, 872 Lowe St., Appleton, Wis.

FOR SALE—New 4 cylinder, 4 cycle, 4½ x 4½, 20 H. P. marine motor. About 500 pounds, run 4 weeks. Too heavy for my semi-speed boat, but a dandy launch or cruising outfit. Will take 8 H. P. as part payment, balance cash. B. C. Saunders, Grand Rapids, Mich.

GASOLINE Cruiser for sale: 47 ft. o. n. x 44 ft. w. l. x 10½ ft. b. x 2½ ft. d. Cedar hull, oak frames, copper fastened, mahogany trim; sleeps six. Speed, 12 miles. 21 H. P. 20th Century engine. Gasoline capacity, 600 miles. Double hull, six copper buoyancy safety tanks. Toilet, galley, running water, electric lights, search light, bronze salt water fittings. Completely equipped. Must sell, owner going abroad. E. Heuel, 144 West 99th Street, New York City.

WANTED—Fast runabout. Length, 20 to 26 ft.; beam 4 to 5 ft.; motor, 4 cyl., not over 45 h. p.; speed not less than 22 m. p. h.; seat 4 to 6 persons; auto control; reverse gear; rear starter, etc.; want a dry boat, in good condition and perfect running order, with necessary equipment for comfort and safety. Address G. B. Hooton, Terre Haute, Ind., care Hooton Lum. Co., stating age and make of both boat and motor.

FOR SALE AND CHARTER—Sail and motor boats of all types, suitable for the Great South Bay. Frank M. Weeks, 272 River Ave., Patchogue, L. I.

WANTED—January and February 1911 numbers Motor Boating; also bound copy year 1910. P. S. Benedict, Hibernia Bldg., New Orleans.

CANADIANS, Second-hand engine bargains. Send for list. Guarantees Motor Company, Hamilton, Ont., Canada.
 73 Bay Street, North.

NAVAL ARCHITECTS & YACHT BROKERS

Have A Model First

Yacht Owners and Naval Architects

A Model often saves its cost in suggesting desired changes before building is commenced. A handsome ornament for home, office or club. Our models are unequalled in quality of workmanship and perfection of detail. Prices moderate. *Investigate.*

The B. A. B. MODEL & MFG. CO., 675 Hudson St.
Phone 1110 Chelsea. New York City

ARTHUR BINNEY

Successor to EDWARD BURGESS

NAVAL ARCHITECT AND YACHT BROKER

Mason Building, 70 Kilby Street, Boston, Mass.

Agent for The Standard Marine Motor, The Commercial Acetylene Co. (Safety Storage System.)

TELEPHONES:

Office, 2781, Main. Residence, 3823-3, Brooklyn.

YACHT BROKERAGE DEPARTMENT:

Commission on Sales, 5 per Cent. Commission on Charters, 10 per Cent.

BOWES & MOWER

Naval Architects and Engineers

Yacht and Vessel Brokers

Offices, Lafayette Bldg., Chestnut and Fifth Streets

Bell Phone PHILADELPHIA, PA. Cable Bomo

NEW YORK JERSEY CITY BAYONNE

BRUNS KIMBALL & CO., Inc.

131 Liberty St., New York Phone, 2614 Rector

THE LARGEST and MOST RELIABLE

MARINE AGENTS and YACHT BROKERS

Sell for bargain list of first-class second hand engines or boats

Engine Installing : : Yacht Repairing

COX & STEVENS

Engineers and Naval Architects,

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16 WILLIAM STREET NEW YORK CITY

Telephone 1375 Broad

JAMES CRAIG

807-841 Garfield Ave. Jersey City, N. J.
Tel. 2237 Bergen.

DESIGNER AND CONSTRUCTOR OF
MARINE GASOLINE ENGINES AND
SPECIAL MECHANISMS, SEVEN TO
THREE HUNDRED HORSEPOWER

DOWNEY SHIPYARD & MARINE COMPANY

Yachts, Steam or Sail, and Motor Boats

Built, Repaired, Bought, Sold, Chartered

SHIPYARD, Marine Construction and Repair Dept.,

23rd and 24th Streets and 3rd Ave., Brooklyn, N. Y.

NEW YORK OFFICE, 30 CHURCH STREET

Cable Address: "Downeyard," New York

Eastern Motor Sales Co.

DESIGNERS—BUILDERS

HYDROPLANE SPECIALISTS

MARINE MOTORS OF ALL TYPES

78 Broad St. NEW YORK CITY

Shops Bay 44th St., Gravesend Beach

L. E. GEARY

Naval Architect, Engineer and Broker

Steel, wood and composite yachts and commercial vessels
designed and construction supervised.

303 Grand Trunk Pacific Dock
SEATTLE

GIELOW & ORR

Naval Architects, Engineers and Brokers

Marine Insurance

52 BROADWAY, NEW YORK, N. Y.

Telephone 4673 Broad

Please Specifications and Estimates furnished for all requirements
Descriptions and Photos submitted upon receipt of inquiry.

The New York Show.

(Continued from page 58.)

The Thibaut & Walker Co., Long Island City, N. Y., exhibited samples of their varnishes and varnish remover in space No. 66. This company makes the Pellucid spar varnish for boat exteriors. This is a very durable varnish that will not blister or spot and is not affected by gases, will set free of dust in from 6 to 8 hours and dries with a good gloss in 24 hours. Another paint specialty that is useful for boatmen to remember is the Thibaut & Walker sanitary white enamel for the interiors of cabins, etc. Besides its own products, this company is the agent for the Chalco varnish and paint remover, made by the H. B. Chalmers Co., of Schenectady, N. Y.

The Kokomo Electric Co., Kokomo, Ind., exhibited a large line of magnetos and ignition specialties. The type B magneto, designed to meet the requirements of the double ignition system, is provided with ball bearings throughout. The magnets are made from high-grade Tungsten steel and the armature is of the H type, with laminated center. One of the features of this magneto is the accessibility of all working parts, which has been worked out to such an extent that no tools are required to get at any part that may need attention. A large range of spark advance is provided for in the breaker box and the points are of platinum iridium. In connection with this company's exhibit, was that of Byrne, Kingston & Co., of Kokomo, makers of the Kingston carburetor.

The Insurance Company of North America, of Philadelphia, Pa., of which Platt & Farnum, 27 William Street, are the New York managers, had booth No. 2 on the balcony. Here the company had literature pertaining to motor boat insurance and also interesting pictures of wrecks, etc., which attracted many of the visitors. This company is one of the old concerns, having been incorporated in 1792, and has assets at present of over \$16,000,000.

The C. A. Woolsey Paint & Color Co., of 500 Grand St., Jersey City, N. J., occupied space No. 16. Here the company had on display samples of their copper "Best" paint, special yacht copper paints, light sea green anti-fouling bottom paint, copper bronze anti-fouling bottom paint, yacht whites, spar varnish, deck paints, engine paints, and elastic seam fillers. These were shown by means of color boards painted with the paints and varnishes, and sample color cards were provided for distribution to interested visitors. The C. A. Woolsey Co., is one of the early manufacturers of copper paint and one of the first to specialize on high-grade marine paints.

The Lamb Boat & Engine Co., of Clinton, Iowa, with a New York office at 30 Church Street, had a complete line of their marine motors in space M. This included a light-weight high-speed motor, with both intake and exhaust valves in the head, in a four-cylinder 35-40 h.p. and a six-cylinder 60-70 h.p. size. With these, the special 10 h.p. long-stroke engine was shown. This engine has a bore of 4 1/4 inches and a stroke of 6 3/4 inches. The regular line of Lamb motors was represented in the medium-duty type by a two-cylinder 12 h.p., three-cylinder 18 h.p., four-cylinder 24 h.p. and six-cylinder 40 h.p. These engines have cylinders 5 1/4 x 6 inches, are of the L-head type with the Splitdorf system of ignition and are fitted with air compressor and bilge pump. Heavy-duty engines were shown in two-cylinder 20 h.p., three-cylinder 30 h.p., four-cylinder 40 h.p. and six-cylinder 60 h.p., sizes all having a bore of 6 5/8 inches and a 7-inch stroke. Splitdorf magnetos are used on all except the 60 h.p. size which has a Bosch low-tension magneto and magnetic plugs. At one end of the exhibit a large frame formed a background in which photographs of many of the prominent boats of last season were shown. In addition to the engines, a 37 ft. high speed Lawley day cruiser was shown, beautifully finished in mahogany and equipped with a six-cylinder 60 h.p. Lamb motor. The owner's

(Continued on page 94.)

WHITTELEY & WHITTELEY

NAVAL ARCHITECTS AND ENGINEERS

11 BROADWAY

NEW YORK, N. Y.



NAVAL ARCHITECTS & YACHT BROKERS

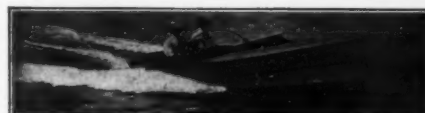


Photo 11—"The most successful 21 footer—Speed, Seaworthiness, Comfort and Simplicity. Amateurs can build my original "V" bottom boats. Send stamp for illustrated circular of design.

WILLIAM H. HAND, JR., Naval Architect, New Bedford, Mass.

Hand-Homer-Bath Marine Construction Co.

V-BOTTOMS

Simple for an amateur to build. Knock down or complete boats as desired
PRICES REASONABLE

A. P. HOMER, 159 State St., Boston

General Sales Agent, Bath Marine Construction Co.

KROGMAN & PURDY

Yacht and Ship Brokers

HIGH GRADE YACHTS OF ALL TYPES
FOR SALE AND CHARTER

92 State Street, Boston, Mass.

Correspondence Invited Particulars Furnished

GEO. H. MILLER & CO.

Launch and Yacht Builders

PATCHOGUE, N. Y.

Get Our Estimate Now.

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MARINE RAILWAYS, STORAGE, REPAIRS

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THEODORE D. WELLS

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32 Broadway, New York.

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A Specialty of Steam Yachts, Power Boats and Sailing Yacht.

Reservoir to H. O. WINTRINGHAM and

WINTRINGHAM AND WELLS.

Morris M. Whitaker, N.A.

Motor Boat Specialist

Metropolitan Life Tower, New York City

Sketches submitted on receipt of your requirements.

JEFFERY'S MARINE GLUE

*The Purposes For Which
the Various Grades
Are Intended*

For Deck and Hull Seams of Yachts and
Motor Boats,

—USE—

No. 1, Extra Quality

Black, white, yellow or mahogany color. Give
black the preference; it is more elastic and satis-
factory in every way.

Specified by all first-class designers, and used ex-
clusively by all the prominent builders.

FOR SHIPS' DECKS USE

No. 2, First Quality Ship Glue

No. 3, Special Navy Glue

For Waterproofing Canvas, for Covering
Decks, Tops of Cabins, Canvas
Boats and Canoes

—USE—

No. 7, Soft Quality

Black, white or yellow. It not only water-proofs
and preserves the canvas, but attaches it to the
wood, and with a coat of paint once a year will
last as long as the boat.

Waterproof Liquid Glue
is used for the same purposes as No. 7
Soft Quality

Also in Combination with Calico Between
the Double Planking of Diagonally
Built Boats

It is ready for use, requires no heating; simply
open the can and paint it on, like ready-mixed
paint.

This glue will also attach cork, felt, rubber, leather
and linoleum to iron, steel or wood.

Special Marine Canoe Glue

Best Filler for Canvas

Black, White and Yellow

Our 25c. emergency cans made a big hit. Every
connoisseur should carry one; it is as valuable to him
as a repair kit to a bicyclist or automobilist.

It is a Johnnie-on-the-spot article that no boat-
man should be without. Sent by mail on receipt of
30 cents in stamps.

All put up in 1, 2, 3 and 5-lb. cans; also in
14, 28, 56, 112-lb. boxes, either tin or wood.

**Insist on Having the RIGHT
Kind if You Hope to Obtain
Satisfactory Results**

The largest dealer in your town carries this in
stock, if not, he should. Tell him to write us for
the agency.

AGENTS WANTED EVERYWHERE
For Sale by all Yacht, Boat and Canoe
Supply Houses and Sporting Goods
Dealers. Send for Samples, Specimens,
Circulars, Directions for Use, Etc.

L. W. FERDINAND & CO.

Importers and Distributors

201 South Street

BOSTON, MASS., U. S. A.

Kenbec Motor Canoes

Combine all the grace and pleasure of the canoes with
the speed and convenience of the motor boat.
Specially constructed motor, thoroughly tested and
reliable. Hull of unequalled design and finish. Strong
yet light. If equipped with spars, absolutely non-
compressible. Write for catalog of motor, sailing and
paddling canoes.

Kenbec Motor Canoe Co., 95 Chapin St., Waterville, Me.

IMPERVO

Waterproof Cloth

Keeps you dry in all weathers, under all conditions,
all the time. It defies the elements. Requires no at-
tention, always ready to wear.

E. A. ARMSTRONG, 208 W. Maple St., Chicago.

The New York Show.

(Continued from page 93.)

quarters were located aft and the accommoda-
tions for the crew forward. The boat was de-
signed by Fred Lawley and has a speed of 17
miles an hour.

The Standard Motor Construction Co.,
Jersey City, N. J., had their exhibit in spaces
O and N. The line of engines shown included
a 10-12 h.p., 20-24 h.p., 32-37 h.p., 50-54 h.p.,
125-150 h.p., and a 300 h.p. racing engine, as
well as a 25 h.p. auto-marine motor and a 4¼
k.w. auxiliary. The 300 h.p. racing machine is for
the hydroplane built by the Electric Launch
Company, to be entered in the next Interna-
tional Harmsworth Cup Race. This engine
was operated by a small motor and attracted
much interested attention.

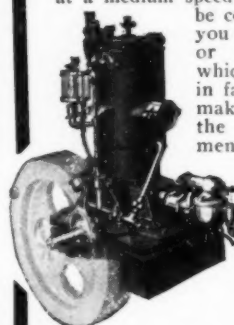
The Ferro Machine & Foundry Co.,
Cleveland, Ohio, exhibited at the New York
show with the Gasoline Engine & Equip-
ment Co. An interesting feature of the
exhibit was a 3 h.p. portable outfit mounted
on a truck, which could be transferred
ready to run from one place to another. The
stationary engine line was represented by a
5½ h.p. semi-portable machine. Marine
engines were shown in an 8 h.p. size with
reverse gear, and Bosch high tension water-
proof magneto, 12 h.p., 5½ h.p., 7½ h.p., 11
h.p., 15 h.p., and 17 h.p. sizes; also a 25 h.p.
with reverse gear and Bosch dual ignition
system. These engines were all 1912 models,
with improved timer to carbureter and mag-
neto control. The controls are more con-
cealed than in the 1911 machine which makes
them well adapted for salt water use. The oil-
ing system has also been improved upon and
a new check valve located above the top of
the filler tube prevents fouling and insures
regularity in the operation of the oil feed.
The engines all have the offset cylinder de-
sign which is a characteristic of the Ferro
line. The reverse gear has been changed by
moving the handle from the side of the gear
frame to the center of the gear, in line with
the propeller shaft. This gives a direct pur-
chase on the clutch cone and yoke and does
away with transmitting power through an
auxiliary shaft.

The Sterling Engine Co., Buffalo, N. Y.,
exhibited on the main floor. Here were shown
eight marine motors ranging from 12 to 150
h.p., including in the heavy duty type, 12-15
h.p., 25-35 h.p., 40 h.p. and 60 h.p. sizes, the
25-40 h.p. semi-heavy duty motor and the
18-25 h.p., 45-65 h.p. and 150 h.p. speed
engines. The 25-35 h.p. long stroke, four
cylinder, heavy duty motor is the company's
new model for 1912. The cylinders are
5½ x 8 in., and the engine is designed espe-
cially for cruising and work boats. The big
eight-cylinder 150 h.p., 5½ x 6¾ in. racing
engine is another novelty for this year. It
has a manganese bronze base and is hung on
the three point suspension principle, which
protects the motor from strains due to the
twisting of the hull. In spaces T and W
was exhibited the Dixie Jr., the remark-
able little 20-foot hydroplane designed by
Tams, Lemoine & Crane, and guaranteed to
make 35 miles an hour. The boat has a beam
of only 4 ft. 6 in., and is built on the lines
of the famous Dixie IV, which was a
product of the same concern. The "Dixie Jr."
is equipped with a 45-65 h.p., six-cylinder
Sterling engine which develops 85 h.p. on
brake at 1000 r. p. m. The engine is aft of
the man at the wheel so that the spray and
gases are thrown well behind him.

The Fay & Bowen Engine Co., Geneva,
N. Y., exhibited in section Q on the main
floor. The display consisted of one of the
company's 25-foot "Special" launches, with a
5-foot beam, equipped with a 10 h.p. double
cylinder engine driving her at a speed of 11
miles an hour. The display of engines in-
cluded a 5 h.p. single cylinder two cycle motor,
a 15 h.p. two cylinder, two cycle convertible
kerosene-gasoline type, a semi-heavy duty,
four-cycle, four-cylinder 25-30 h.p. engine and
a light weight, high speed four cylinder, four
cycle 30-45 h.p. machine, weighing only 820
lbs. complete with clutch. The four cycle
engines in the exhibit were of especial interest
as heretofore the Fay & Bowen people have
been known as makers of two cycle engines
only. The new line is the result of many
months of planning, development and experi-
mentation and cannot fail to be of interest to
motor boat enthusiasts. With the boat and
engines, was shown an electric light generat-
ing set consisting of an engine and dynamo,
storage battery and switch board. These
plants are in use on several well-known yachts
as well as in residences, etc.

THE ROYAL ENGINE

When you get a Royal Engine you
get an engine that is made for con-
stant service and for hard wear—for
the ordinary boat. An engine running
at a medium speed revolution that can
be counted upon to give
you service always, day
or night; an engine
which is daily growing
in favor with men who
make their living on
the water, and these
men know.



You should
know all the
details of this
carefully
constructed
motor.

Write for cata-
logue today

THE ROYAL ENGINE CO.

1050 Broad St.

Bridgeport, Conn.

Good Agents Wanted Everywhere

Q In China doctors are paid a regu-
lar salary to keep their patients well,
failing in this the payments cease
and the doctors are obliged to nurse
their patients back to health—free
of charge.

Q This isn't China—but it wouldn't
be a bad idea for you to send us
\$1.00 for a six months subscription
to OUTING.

Q It will give you more real infor-
mation—more real assistance—on
work and play in the open air than
anything we know.

Q If it doesn't, we cheerfully agree
(like the Chinese doctor) to continue
your name on our mailing list until
you feel that your requirements are
being properly cared for.

Q Will you let us hear from you?

OUTING PUBLISHING COMPANY
OUTING MAGAZINE
161445 WEST 56TH ST. NEW YORK

177 S. MICHIGAN AVE. CHICAGO

BATH Knock Down BOATS

**Fastest for Power
Easiest to Build**

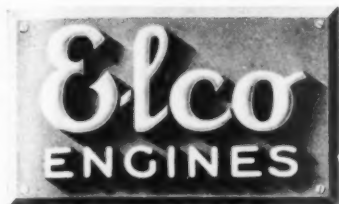
A. P. HOMER
159 State St., Boston, Mass.

CHELSEA CLOCKS

Clocks for use on yachts, steamships, etc., with (patent
applied for) electric attachment for operating ship's bell.
Made by the largest makers in America of exclusively 6-
day high grade marine, ship's bell, mantel and auto
clocks. Write for price list today.

CHELSEA CLOCK CO.,

16 State Street, Boston, Mass.



Racing is the Severest Test

Elco Engines Have Won a Majority of the Important Events for the Past FOUR YEARS.

1911 Victories

\$5,000 Match Race against Mr. Gould's S. Y. "Helenita," 77 miles down Long Island Sound.
N. Y.-Poughkeepsie and return, 132 miles, for Long Distance Championship.
Time Prize, Motor Club of America, N. Y.-Poughkeepsie, 132 miles.
Three Days' Series Racing, 30 miles, for Interstate Championship Trophy.
At St. Augustine, Fla., All Classes, 50 miles, for Southern Championship Trophy.
Spring Race, Columbia Yacht Club, for Commodore Cups, N. Y. to Ardsley, 40 miles.
Fall Race, Columbia Yacht Club, for Commodore Cups, N. Y. to Ardsley, 40 miles.
At Red Bank, N. J., All Classes, for Red Bank Yacht Club Prize.
At Larchmont, 30 miles, for Long Island Sound Speed Trophy. Second boat, also with ELCO Engine, finished 1 second later. Closest race on record.
Manhasset Bay Yacht Club, 20 miles.
Huntington Yacht Club, 30 miles.
At Long Beach, L. I., 30 miles.

1910 Victories

N. Y.-Poughkeepsie and return, 132 miles, for Long Distance Championship.
Time Prize, Motor Club of America, N. Y.-Poughkeepsie, 132 miles.
Three Days' Series Racing, 30 miles, for Interstate Championship Trophy.
Huntington Yacht Club, 30 miles.
Manhasset Bay Yacht Club, 20 miles.
At Huntington, L. I., 30 miles, for Beaux des Arts Cup.
Lake Hopatcong Championship.

1909 Victories

N. Y.-Poughkeepsie and return, 132 miles, for Long Distance Championship.
Three Days' Series Racing, 30 miles, for Interstate Championship Trophy.
Hudson-Fulton Celebration Races at New York.
Hudson-Fulton Celebration Races at Yonkers.
Hudson-Fulton Celebration Races at Newburgh.
Hyannis Yacht Club, 16 miles.
Columbia Yacht Club, 30 miles.

1908 Victories

N. Y.-Poughkeepsie and return, 132 miles, for Long Distance Championship.
Three Days' Series Racing, 30 miles, for Interstate Championship Trophy.

And many other events of lesser importance throughout the country.

Built in Two Sizes:

60-70 H.P., 6-Cyl., Wt. 650 lbs.

40-50 H.P., 4-Cyl., Wt. 475 lbs.

Prices favorable.

ALL these boats were equipped with STOCK ENGINES in which no changes whatsoever were made. Large bore and stroke alone does not develop power—Elco Engines have repeatedly defeated engines rated at *twice* the power because of the superiority of their design and construction. They are built in a celebrated Gun Factory where only the very best material is employed, and by the most experienced mechanics, each part being subjected to a rigid inspection during every stage of its construction. This is the secret of their Racing Success.

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Elco 201 Ave. A., Bayonne, N. J.

27 minutes from Liberty and
23d St. ferries C. R. R. of N. J.



A Challenge

At all times we are prepared to enter into any comparative test as to the merits of our goods.

The leading builders and designers use our goods on their best work.

Our Spar Coating was used on the American Defenders of the International Cup when built and during the actual races. That is an occasion when nothing counts but real merit.

We have attained our present standing by making good. Ask anybody who has used

SMITH'S SPAR COATING

for all exterior wood and metal work exposed to excessive changes in weather and temperature.

SMITH'S QUICK MARINE COATING

(dries quicker than Spar Coating) for all wood and metal work much "awash." For all "hurried" work anywhere. Durable against exposure to wet and weather. Will not turn white under water.

Free on request—"Winners," being a record of the names of the winning yachts and owners of racing season of 1911.

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Built Like an Automobile Engine.
3 to 20 h.p., ready to ship; gasoline or kerosene.
Drives boats of all kinds; starts easy; cannot backfire; almost noiseless. 6-Year ABSOLUTE GUARANTEE -- 30-Day Trial. Three moving parts--women and children run it. Demonstrate an engine for us and get yours at cost. Be first in territory to get offer.
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Engines for All Purposes

Vertical and opposed four cycle, from 6 to 50 h. p.
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Grips the wire by action of a spring. Positive contact. You have seen them on Columbia dry batteries. We make 20 different sizes and shapes. Send 50c. for box of one dozen assorted sizes. Use them on your spark plugs and ignition wires. Send for our circular, free.

FAHNESTOCK ELECTRIC CO.
129 Patchen Ave. Brooklyn, N. Y.

The New York Show.

(Continued from page 94.)

The Eastern Motor Sales Company, 78 Broad Street, New York City, exhibited models and drawings in space No. 35. The company has a shop at the foot of Bay 44th Street, Brooklyn, where motor boat owners can have any necessary work done quickly and expertly. The Eastern Motor Sales Co. are exclusive Eastern agents for the Sintz reversing propellers made by the Wilmarth & Morman Company.

The Columbian Brass Foundry, Freeport, L. I., exhibited a large assortment of Columbian speed propellers, from 10 inches in diameter up to 48 inches, in spaces 40 and 41. A new pattern is being offered this year, known as the Columbian "Rocket" propeller. Another innovation is the Columbian outboard rudder and universal strut combination. This fixture comprises a strut, designed for use aft of the propeller, which supports a light, manganese bronze outboard rudder. When necessary to remove the propeller, the strut can be slid out of its bracket by simply removing two bolts. In addition to the line of propeller wheels, a large array of motor boat accessories was shown, including bronze rudders, rudder ports and rudder shoes, as well as universal struts, shaft logs, stuffing boxes, couplings, etc. The Columbian universal struts have been improved this year by the addition of anti-friction bushings in the bearings.

L. O. Koven & Bro., 50 Cliff Street, New York City, occupied spaces 49 and 50. Included in the display were air whistle tanks, gasoline tanks and cans, tanks for storing gasoline underground and galvanized tanks for boats to be used either in the bow or stern, cans for oily waste, galvanized exhausts and exhaust manifold jackets, as well as automobile gasoline tanks. The company has a large plant at Jersey City and manufactures special tanks, plate steel and sheet iron and copper work of every description for boat use.

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MARINE HORN

ATWATER-KENT MFG. WORKS
2 NORTH 8th STREET PHILADELPHIA, PA.

HALL ENGINES

First to Havana.
First to Key West.
First to Atlantic City.
5600 miles at full speed in rough weather, under all conditions of climate and elements. Winning Four Cups out of Five. Winner of Greatest Race of 1908, Bermuda to New York. Winner National Championship and Challenge Race of New York in 1909. Winner of every race entered in cruiser class in United States in 1909. Holds world's record for hours run and revolutions turned with full load on engine. One to six cylinders.
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Fine mechanical features.
Honest power ratings.
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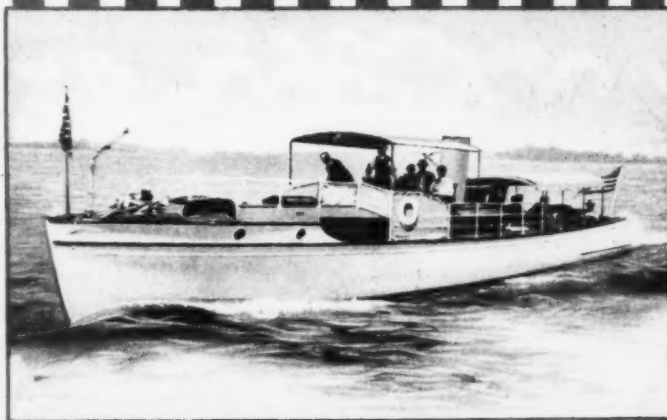
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MATTHEWS CRAFT invariably are successful. ASK ANY OWNER.

THE E. H. CLOSE REALTY CO.

TOLEDO, OHIO, January 2, 1912.

THE MATTHEWS BOAT COMPANY,
Port Clinton, Ohio.

GENTLEMEN: The writer has just been informed that the alterations are about completed on my 60-foot high-speed yacht *SUSANNE*.

With the 30-45-H.P. machines I obtained a speed of 14.7 miles per hour—rather a remarkable showing for the type of boat and amount of power installed. With the higher-powered engines I am looking forward with pleasurable anticipation to the spring, when I can again place the boat in the water.

I have owned for the past few years a number of automobiles, and was desirous of comparing the cost of their

upkeep with that of the boat I purchased from your company. The result has been surprisingly in favor of the boat, and I wish to go on record as saying it has made an aquatic convert of me.

Your work of installing the new 6-cylinder Sterling engines in the craft has been so satisfactory that the writer is compelled to call to your attention his thorough appreciation of your unfailing courtesy in all matters connected with the *SUSANNE* since it was purchased. In these days of hasty business methods yours are all the more to be commended.

Yours very truly,

(Signed)

E. H. Close

Catalogue and plans for interested buyers

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THE ENGINE of REFINEMENT
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The long stroke, heavy-duty cruising engine. — four cylinders, — 25-35 horsepower, — $5\frac{1}{2}$ " bore and 8" stroke.

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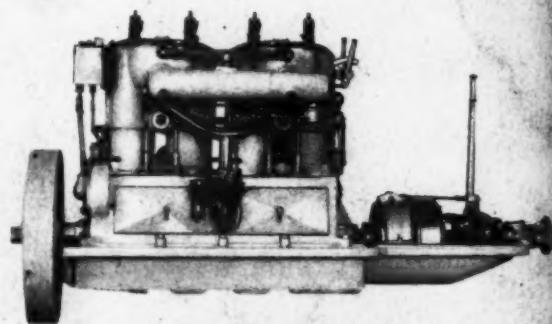
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